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THE IRON AGE

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FEBRUARY 9, 1939

ESTABLISHED 1855

Vol. 143, No. 6

Jobs in the World of Tomorrow And... A Job for the "World of Tomorrow"

PRESENTING some thoughts about a public relation job that needs doing by the New York World's Fair and its exhibitors in behalf of science, invention and industrial progress.

o o o

By JOHN H. VAN DEVENTER *Editor, The Iron Age*

o o o

"WE believe that the program of the Fair must have an underlying social objective. It must demonstrate the betterment of our future American life. It must stress the vastly increased opportunity and the already developed mechanical means which this twentieth century has brought to the masses for better living and accompanying happiness."

(From Statement of the Founders of the New York World's Fair)

THE New York World's Fair will be the most powerful advertisement of science, invention and the machine age yet presented to the public. It will impress millions of people with the ability of modern mechanized industry to turn out an almost unlimited quantity of products—"at the press of a button."

A powerful advertisement is not necessarily a good one. And this one may be very damaging indeed to the future of American industry. The very effect that it will create in the minds of millions of people of almost laborless, automatic production will feed fuel to the fire of the powerful anti-machine propaganda already under way in this country.

Sixty million World's Fair visitors will be exposed to an amazing panorama of productivity in high gear as they visit the various exhibits. Let even a comparatively small percentage of that total go away from the Fair with the belief that the machine is destroying jobs—and hence consuming power—and American industry will soon find productivity wearing a muzzle and a license and spending its future in the dog house.

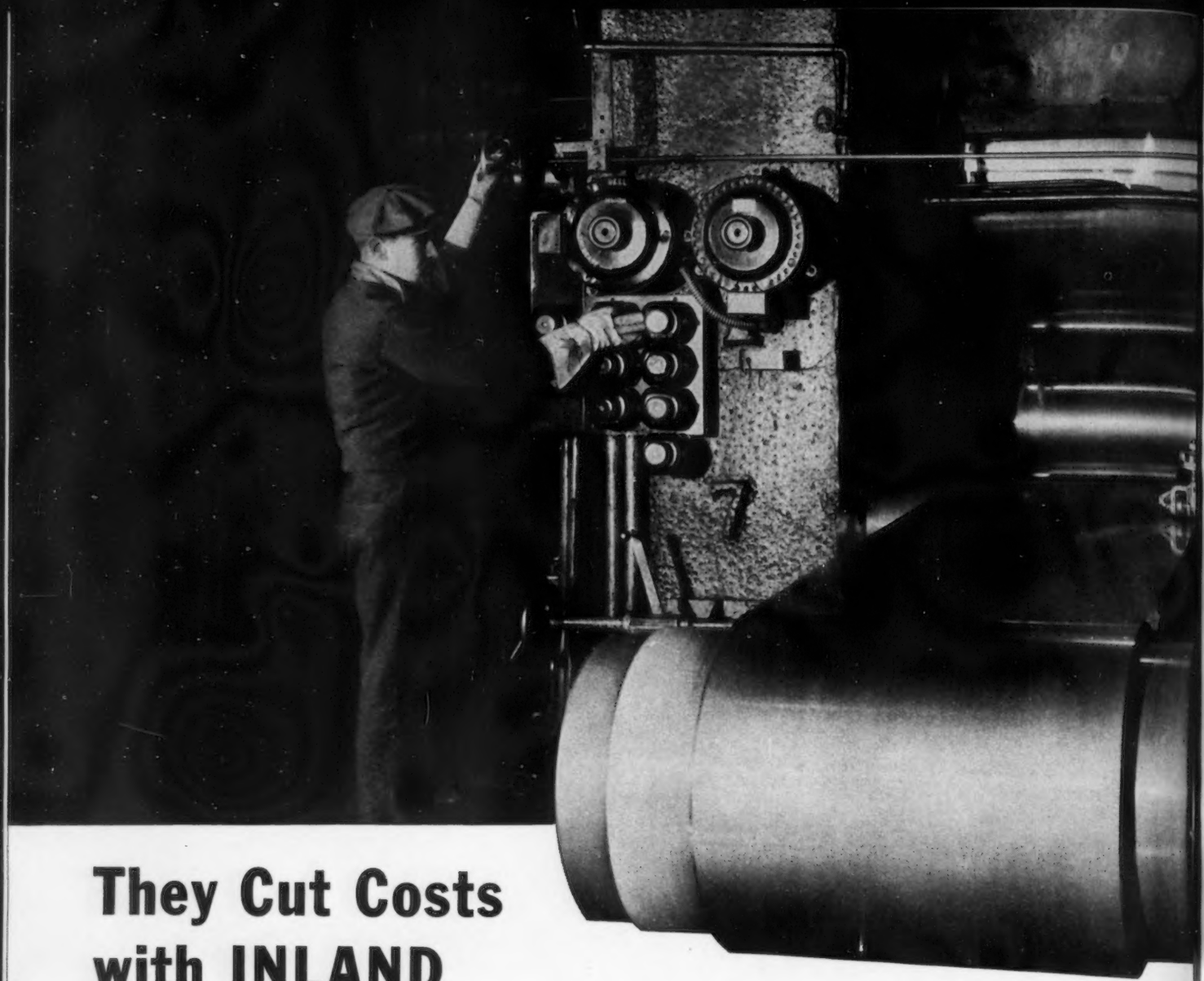
Most of the industrial exhibits at the Fair will be highly mechanized, because mechanized production is dramatic and attracts attention. Proud of his technical accomplishments, each exhibitor naturally puts his best foot forward.

Sometimes it is dangerous to put your best foot forward unless you bring the other one up even with it. I saw an example of this at the recent "opening" of a new steel mill.

Editors and newspaper men from all over the country, as well as industrialists, were invited to inspect this marvelous new continuous sheet mill—last word in steel mechanization. As we wandered through the half mile long mill the general queries of the laymen were "Where are the workers?" "It seems as though steel making is now a matter of pushing buttons." "How many men is this mill going to throw out of work?"

The steel concern quite naturally put its dramatic right foot forward on this occasion. And hundreds of people went away with the firm conviction that technical progress means fewer jobs and less consuming power.

The left foot should have been drawn up and put forward too, because it can be proved that these accomplishments in mechanization open up many more employment



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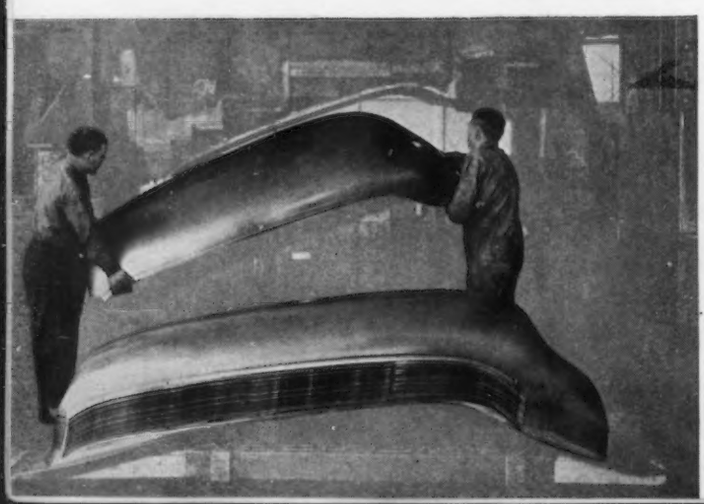

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doors than they close, *both inside and outside of the industry.*

I do not believe that I am exaggerating the seriousness of the wave of anti-machine propaganda. It is being spread from high places, preached from platforms and pulpits as well as from soap boxes.

Here, for example, are some of the things that prominent people have recently said on this subject:

"Science and invention are to blame for the present unemployment in America."
Senator Joseph O'Mahoney

o o o

"In mill and factory, on the farm, on the railroads and down in the mine, men and women are out of work by reason of labor-saving devices."
George H. Earle
Ex-Governor of Pennsylvania

o o o

"Due to better machines and more efficient methods, six workers can do the work that required 10 in 1920."
Harry Hopkins

o o o

"As time goes on, there will be more and more men unable to find employment for technological reasons."
Harold L. Ickes

o o o

"Ever since machinery has come to be the real producing agency of the world, we have had economic maladjustment."
Senator Claude Pepper

o o o

"There is nothing to the proposition that labor-saving devices put more people to work."
Representative Hatton W. Sumners

o o o

Add to these powerful voices the tens of thousands of lesser ones who are singing the same tune day after day and you have a chorus that many millions of Americans are bound to hear and to heed.

Surely the World's Fair of New York does not want to do injury and injustice to science and invention by inadvertently playing an accompaniment.

The World's Fair will perhaps be aiding unintentionally but effectively the acceptance by the public of the machine as an anti-social force and a job destroyer if the following reaction should be a typical one:

TIME—September, 1939

PLACE—Jonesville, Iowa. Pop. 3487

SCENE—Smith's Grocery Store.

(Jim Smith, the grocer, is giving some of his friends his impressions of what he saw at the New York World's Fair)

(Jim Smith): "Glad I took the trip, boys. It was the most marvelous and impressive spectacle I ever saw. Makes one think of the wonders predicted in Revelation, especially that part about 'wheels within wheels'. Every last one of you ought to make sure that you get to New York to see it."

(Dr. Brown): "I hear that it was a wonderful demonstration of the advances made by science and invention, Jim."

(Jim Smith): "Wonderful indeed, Doc, and so wonderful that I have begun to wonder, and to worry a bit about what the future will be for us. I saw the most amazing automatic machines turning out great quantities of products without the aid of human hands. I saw tires made at the rate of one every four minutes, glass bottles being blown by machines, models of great oil refining plants and steel making plants where labor seemed to consist of occasionally pushing electric switch buttons. Even cows milked by machinery. No wonder we have 10 million unemployed in this country."

(Rev. Jones): "If you came to church, Jim, as you should, you would have heard what I think about machines creating technological unemployment. What's the use of making machines to turn out more and more things when these same machines cause more and more people to be unable to buy what they make?"

(Congressman Parlorpink): "Maybe you fellows will come to agree with me that we ought to pass some laws to slow down science and invention until society catches up with them!"

o o o

"We believe that the World's Fair must have an underlying social objective."

(From statement of the Founders.)

The World's Fair has a tremendous social responsibility because of the many millions of Americans whose thinking and actions will be influenced by it. It cannot afford to glorify or to excuse any forces or factors whose effects may be anti-social. Even science and invention.

If it were true that the machine, which is the point of application of science and invention to industry and production is a diminisher of employment and mass purchasing power, the Fair would be socially remiss in not taking cognizance of it, just as a doctor or surgeon would be remiss if he suspected a cancer and did not expose it and attempt to cure it.

By the same token, the physician or surgeon who knows that his patient does not have a cancer but who permits him to continue in the belief that he has, is doubly remiss in his duty.

I know that the officials of the World's Fair and the exhibitors who will display their achievements in science, invention and mechanization do not believe that these things create unemployment. They are so thoroughly convinced to the contrary; know so well that these things are our chief creators of employment that they have perhaps overlooked the fact that more and more people are coming to the opposite belief.

Under these circumstances, if the Fair demonstrates the accomplishments of science, invention and machinery in producing more and better products without demonstrating with equal force that these also create more jobs

and better purchasing power, it will fall short of its social objectives and perhaps of its greatest opportunity.

Why Not Leave This Job to the Individual Exhibitors?

The answer to this is that it is beyond the scope and the power of an individual exhibitor to do it properly. It is an overlapping inter-industry job that can only be properly done through coordination and central direction.

An improvement in mechanization sets up concentric circles of effect, similar to that of a stone being dropped into a pond.

The first circle of effect is within the confines of the company and the industry. It may be that here the employment effect is apparently bad in the sense that an invention enables a fewer number of workers to attain a larger output.

But these concentric rings of effect extend far beyond the original plant and industry. And in these outer rings new and larger uses of the product create new and enlarged job opportunities far outweighing the initial displacement.

Take, for example, the cotton gin. Its first impact in the inner circle was destructive to employment in that one or two men, at a gin, could comb more cotton than could several hundred of the previous hand workers.

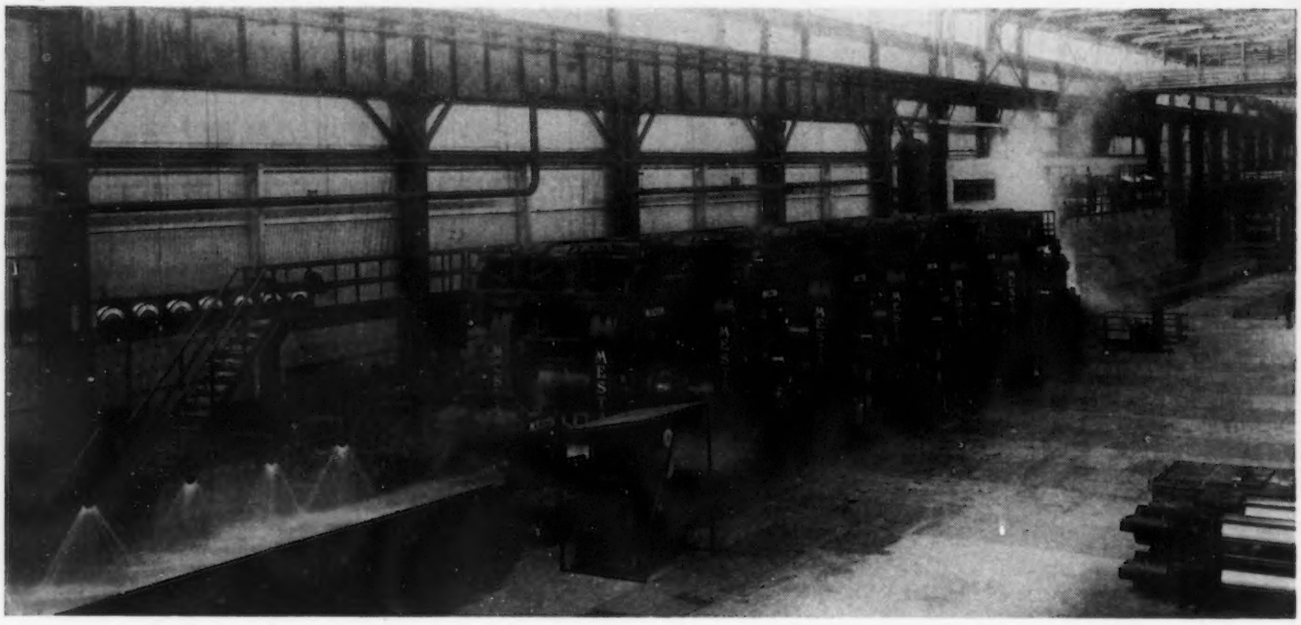
But as this invention threw out its larger concentric circles, think of the millions of jobs it created on the farm in raising cotton, in the mill at weaving and spinning it, in factories that make cotton products and all along the line of distribution.

It is because an invention's principal effects are in the outer concentric circles that no individual concern or industry can properly appraise the effect of technology upon employment.

Can the New York World's Fair undertake such a job with hope of success?

I am firmly convinced that it can, especially since it can command the cooperation and assistance of every industrial exhibitor at the Fair, once the objectives are presented.

Many of the chief executives of the exhibiting concerns are keenly aware of the value of public relations. These men represent the points of practical application of science and invention to industry through mechanization. They will welcome a practical plan to disabuse the public of the impression that mechanization destroys jobs and to show Mr. and Mrs. Average Man how it multiplies them.



WHAT impression of mechanization do YOU get from these pictures of a modern steel plant. "How many men will this new mill throw out of work?" asked the newspaper men as they went through the plant at the opening ceremonies.

I believe that each of these men will agree with me that if the World's Fair will undertake this vitally important public relations job it will be doing the biggest thing for science, invention, American industry and the American public that has been done in the last half century.

How can such a job be done?

If it had been thought of sooner, it might have been done by having a building known as the "Hall of Machine Made Jobs." In this, by exhibits, motion pictures, etc., would be shown the work creating power of science and invention in the various concentric circles of some well known mechanized products.

Just as one dramatic example one might have taken the continuous strip and sheet mill, notorious job destroyer, so called, of the steel industry. It might have been shown that even in the birthplace of this monster, where it has been at work the longest, it has doubled employment even

° ° °

WHAT impression about the machine and employment do YOU get from these pictures of one of the most modern textiles plants.

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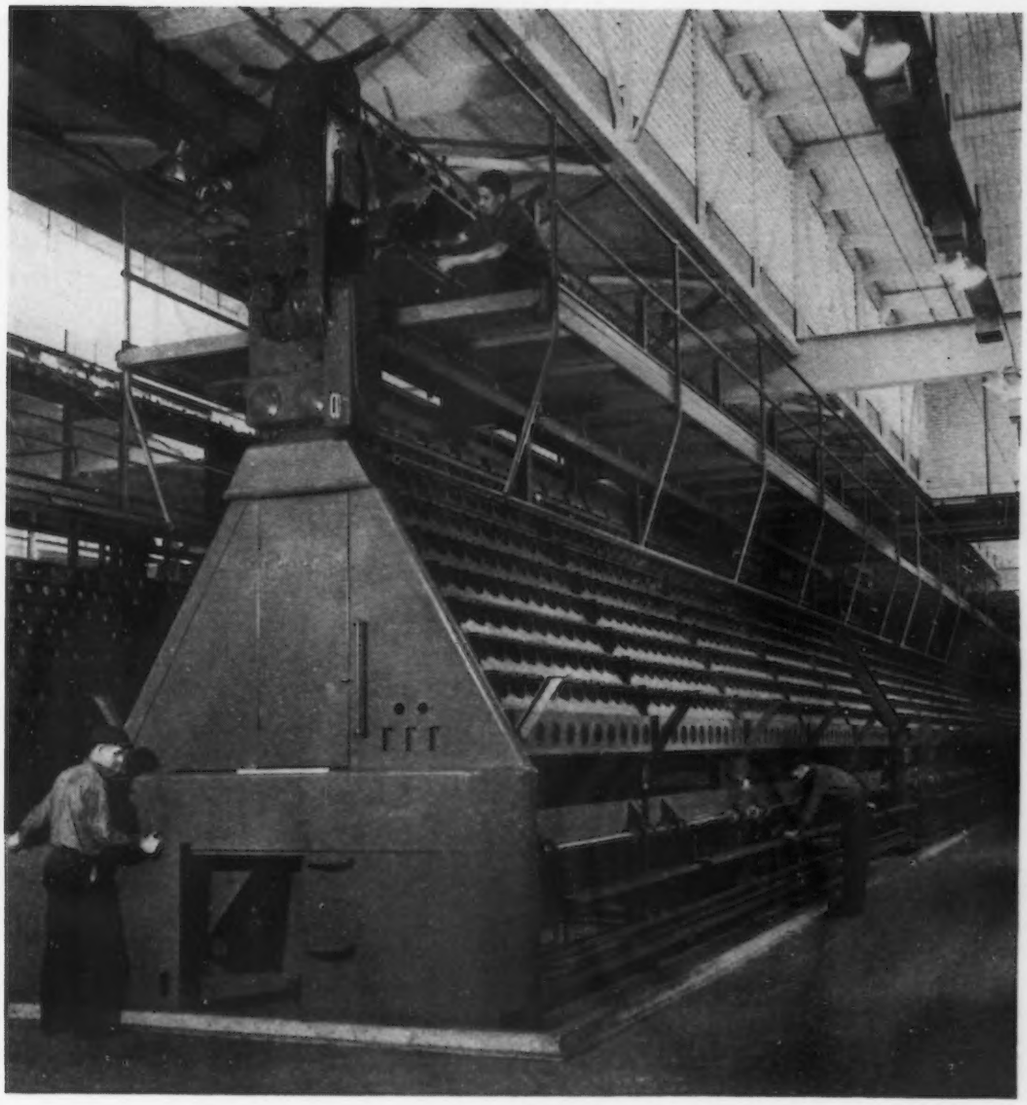
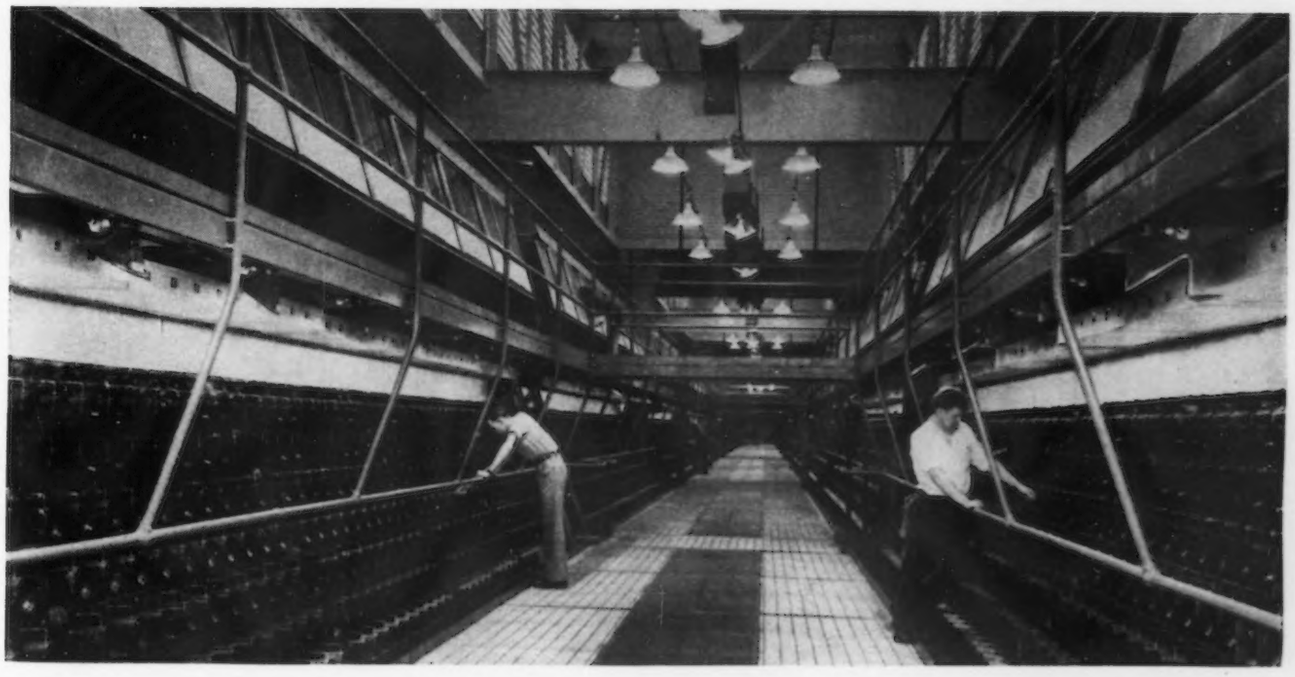
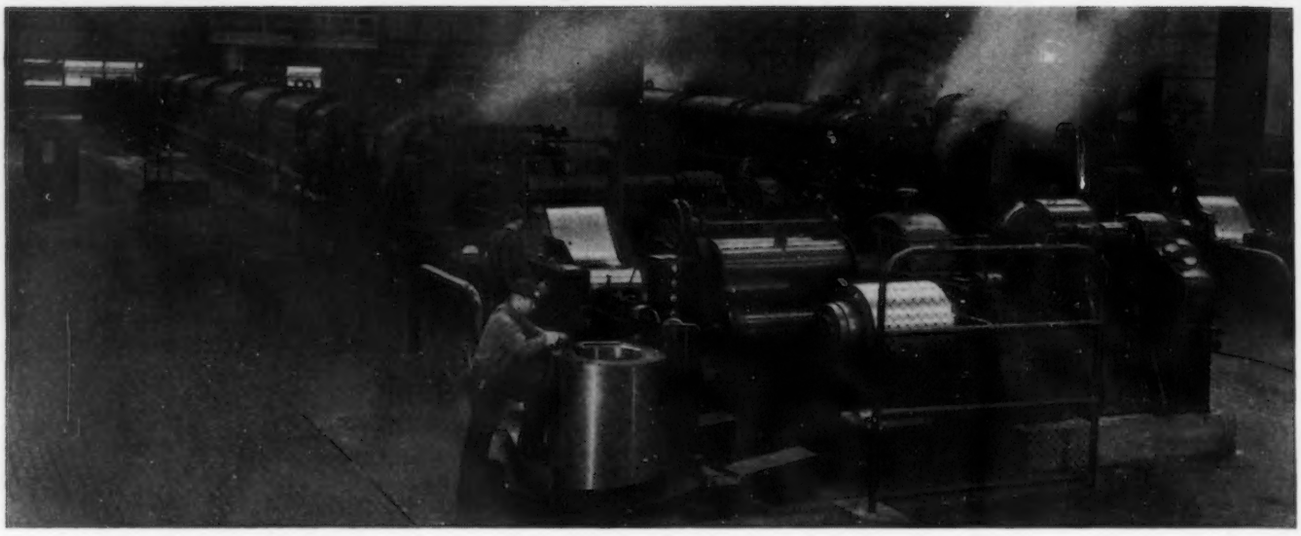






"IT seems as though steel making is now a matter of pushing buttons" was a comment heard on all sides when this mill was opened.

within its innermost circle. That it saved American consumers of sheet steel in the single year 1937 the stupendous sum of $625,000,000 in price reduction. And that it quadrupled the annual output of sheets and strip since 1923, when it came into being. And that in spite of its astronomical output in 1937, equivalent to a sheet steel band four feet wide around the world and reaching to the moon and back again, every pound of this was used in useful production and every pound thus used created additional employment in the circles outside of the steel industry.

It is too late, probably to consider a Hall of Machine Made Jobs. But it is not too late to see to it that the 60,000,000 visitors to the World's Fair shall have this side of the economic picture presented to them.

Not only for the steel industry, but for the automobile industry, the textile industry, the glass industry and the hundreds of exhibiting industries which rely upon science and invention as their central theme of progress.

How can such a job be organized?

It can be put into motion very readily, under the sponsorship of the World's Fair by submitting a practical program of action to the principal exhibitors and enlisting their cooperation in carrying it out.

Such a program of action would be divided into two parts. One part would consist in the individual efforts which could be made by each exhibitor to show to the public the employment creating effect of science and invention as exemplified in his own particular product or products. This could be done through the media of supplementary displays, posters, etc., and by the inclusion of information in the literature that is prepared for handout.

The second part would be shaped to do the job for the broader phases of the subject which go beyond the individual industry and which have to do with the employment effects in the outer concentric circles. This could be accomplished through the medium of a popular motion picture entitled "How Science and Invention Multiply Jobs and Wages" to be exhibited as a "short" feature at the various projection rooms at the Fair and also by means of an attractively illustrated brochure for general distribution by the exhibitors.

Can this subject be properly dramatized for popular presentation?

The World's Fair itself answers that question. In effect it will be without doubt the most dramatic presentation of what science, invention and machinery have done to multiply the products which masses of people want and need and to put these products within reach of modest purchasing power.

But even more dramatic are the possibilities of showing what these great social forces have also done to multiply jobs and to increase the incomes of wage earners. A story can be told either in pictures or text that will hold an audience spellbound and that will conclusively end the dangerous and spreading fallacy that the price of technical progress is unemployment and human distress.

Relative Machinability of Steels

Effect of Alloys, Heat Treatment and Grain Size Demonstrated

By ALFRED KULLMAN

Assistant Works Manager, American Tool Works Co., Cincinnati

THE turning demonstration here reported was made at a recent meeting of the metal cutting group of the Cincinnati chapter of the American Society for Metals, held at the plant of the American Tool Works Co. It was to show something of the effect of alloys, grain size and heat treatment of steels on their machinability.

In 1937 a steel company made repeated tests over a period of months to determine the relative machinability of various steels. They bought a first-class automatic screw machine, set up about five different operations using the same piece with the same cutting tools, all things being held constant but the steels. In the demonstration here reported we attempted to do the same thing. We followed general shop practice, and no attempt was made to find the optimum condition for any class of steel.

Steels, heat treatments, and grain size selected for this demonstration were such as are commonly used by ourselves and by other Cincinnati plants. All of them have distinct classes of use.

The various steels tested are listed in Table I, herewith. The first is ordinary so-called "cold roll" screw machine steel, S.A.E. No. 1112, which can be run really fast on an automatic. As this free cutting screw stock rates 100 per cent on machinability rating tables, it may be taken as the standard for comparison.

The next steel selected was S.A.E. No. X-1335 which is sometimes heat treated but most of the time not, and is a steel that can be designated as something better than "cold roll." In physical properties it is quite similar to S.A.E. No. 1045, although higher in manganese and reputedly free machining through a screw machine. The alloy steels selected were S.A.E. No. 4145 in three different conditions, and an S.A.E. 3135 steel coarse grain.

Type of Test Explained

The tools employed in the test are pictured in Fig. 1. The bits are of conventional 18-4-1 high-speed steel, of a popular brand. All were ground identically, and to angles which a practical shop man would say are about right. These angles were: Front clearance, 22 deg.; front relief, 10 deg.; top side rake, 10 deg.; offset, 6 deg.; side clearance, 6 deg.; and nose radius, 3/64 in. Furthermore, all bits came from the manufacturer at the same time and were hardened at the same time. During the tests, the tools were run in a bit holder in the lathe at cutting speeds of 50 and 100 ft. per min., in all cases keeping the feed, 1/32 in. per revolution, and the depth of cut, ¼ in., constant. There was but one variable, namely, the steels. The bars

TABLE I

Cut No.	S.A.E. No.	Cut Feet	Hp.	Length of Cut	Conditioning Tool
1	1112	50	5	6 in.	Tool OK
2	1112	100	9	6 in.	Tool OK
3	X-1335	50	5	6 in.	Tool OK
4	X-1335	100	10	⅜ in.	Tool failed
5	4145 annealed No. 6 to 8 Grain	50	7-6*	6 in.	Tool OK
6	195 to 215 Brinell	100	11	¼ in.	Tool failed
7	4145 heat treated No. 6 to 8 Grain	50	6.5-6*	6 in.	Tool OK
8	241 to 285 Brinell	100	10	1/6 in.	Tool failed
9	4145 as rolled No. 6 to 8 Grain	50	6	¾ in.	Tool failed
10	241 to 364 Brinell	100	Not attempted		
11	3145 annealed No. 4 Grain	50	6-5.5*	6 in.	Tool OK
12	163 to 217 Brinell	100	10	¼ in.	Tool failed

Idle
2.5 hp. at 50 ft.
3.5 hp. at 100 ft.

* Readings before and after cratering of tool

Feed—0.031 in. per rev.
Depth of Cuts—¼ in.
Machine—20 in. American Lathe
Motor—20 hp., d.c.

on which the tests were made were in all cases 6 in. in diameter, and were cold finished. With the cold finished bars we avoided complications due to scale, which in itself has a very appreciable effect on tool life. Furthermore, it is standard practice in many plants to use only cold finished bars.

The original cut at 50 ft. per min. was 6 in. long, where the tool held up. The bit was then changed and put aside for comparison with other bits used in the tests. Then we ran another bit at 100 ft. per min. for 6 in., so that if they both held up the total length of cut on any one bar would be 12 in.

In the case of each test the character of the chip coming from the tool as the tool bit went to work was first observed, and later on, the change caused by the effect that all long chip materials have on cutting tools was noted. The long chips make a groove, or crater, some distance back of the tool edge, and this causes the long and stringy chips to break off. Then, of course, the condition of each tool after it completed its cut was noted.

For all tests a 20-in. American engine lathe driven by a 20-hp. variable-speed motor through a four-speed geared head was employed. A cutmeter was provided to permit direct reading of the peripheral speed of the work. Horsepower consumed was measured; for this an ammeter calibrated to approximately the horsepower was installed in the circuit.

Results with No. 1112 Steel

The results of tests on the No. 1112 steel are summarized in Table I. The chips were at first long, and then broke very short. The tool stood up the full 6 in. In cut No. 2, on the same material but at 100 ft. per min., long chips also formed at the beginning of the cut, and short chips were produced later, after the crater had been formed. From Fig. 1, it will be seen that tool No. 2 was a little more damaged than tool No. 1. The formation of a crust of steel right at the edge is typical of the action of steel cutting. It was to be noticed that the edge of the tool did practically no cutting; the built-up edge pushed the metal off. Coolant made up of small amount of soluble oil in water was used in the tests.

At the 100-ft. speed, power consumption increased from 5-hp. to 9-hp. A factor often overlooked in the machining of metals is that the horsepower required on any particular job is dependent upon the number of cubic inches of metal removed. In other words, if the cut is twice as fast, twice as much power will be consumed. For cast iron the rule of thumb is that the machine requires 1-hp. for each 2 cu. in. of metal removed per minute. For soft steel, it is 1¼ cu. in. The harder the steel, the higher the ratio is. For hard steel you may need 1-hp. for each ½ cu. in. of metal removed per min. Power consumed by the 20-in. lathe when running idle at 50 ft. per min. was 2½ hp. and at 100 ft. per min., 3½ hp.

From the results of cut No. 2, it will be seen that 100 ft. per min. on S.A.E. No. 1112 steel is quite satisfactory.

In the case of the S.A.E. No. X-1335 steel, items 3 and 4 of Table I, the chips were different in character due to the fact that the higher carbon steel is tougher, resulting in a better breaking up of the chips. At 50 ft. per min. the tool (Fig. 1, No. 3) stood up very well. It cratered quite a bit and the crater was deeper than on tools Nos. 1 and 2. It also has a built-up edge. In running this steel at 100 ft. per min. the tool failed rather miserably after ⅜-in. length of cut. The only conclusion, therefore, is that the practical cutting speed of this particular steel is somewhere between 50 and 100 ft. per min.; it may be 52 or 98.

Photomicrographs of the Nos. 1112 and X-1335 steels are reproduced in Figs. 2 and 3, respectively. The original 100X magnification was enlarged three times to produce a 300X magnification. The difference in structure between these two steels is obvious.

No. 4145 Steel Tested

For the next series of tests one of the common S.A.E. numbers, namely, 4145, was selected. This is a fine grained alloy steel—6 to 8 grain. Bars of this material in three different conditions — annealed, quenched and drawn, and "as rolled"—were tested, as indicated in Table I, items 5-10.

Each of these bars was turned at 50 ft. per min. for 6 in., where the tool could take it, and then at 100 ft. per min. for 6 in., where the tool could take it. The feed and depth of cut remained the same as before.

In the case of the annealed material (195 to 215 Brinell), Cut No. 5, it was to be noticed that the chips were entirely different in character than any of the previous ones. But, as before, they were long and continuous at first and later began to break up. The original long chip is pretty dangerous to the operators, and also a cause for some cussing on the part of the fellow who cleans up. The damage to this tool indicated that 50 ft. per min. cutting speed is satisfactory. There was wear on the side of the tool, and this

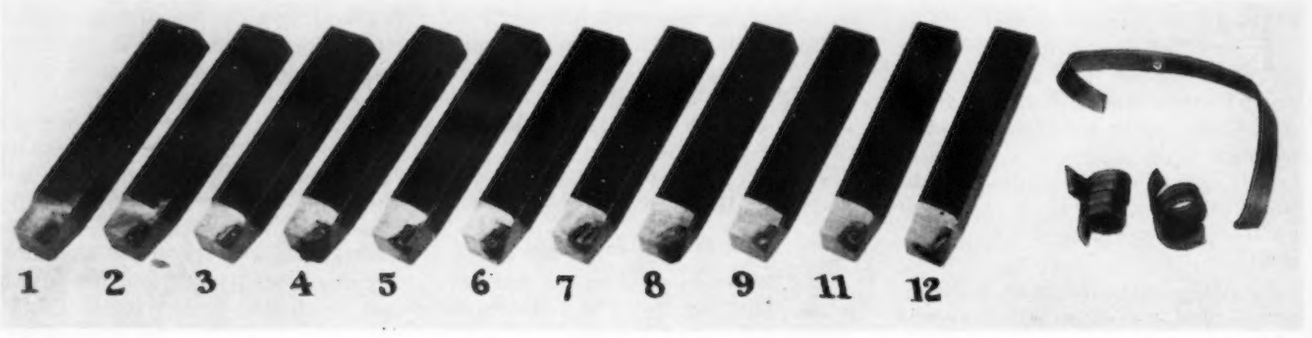


FIG. 1—Appearance of tools after turning demonstration. All tools are of high-speed steel and ground to the same angles. Those numbered 1,3,5, etc., were run at 50 ft. per min. cutting speed and those numbered 2,4,6, etc., were run at 100 ft. per min. Tools Nos. 1 and 2 were used on the S.A.E. 1112 steel; Nos. 3 and 4 on the X-1335 steel; Nos. 5-10, on the 4145 steel in annealed, heat treated and "as cooled" condition, respectively; and tools Nos. 11-12 on the 3145 steel, coarse grain, annealed. Length of cut and other data are given in Table I.

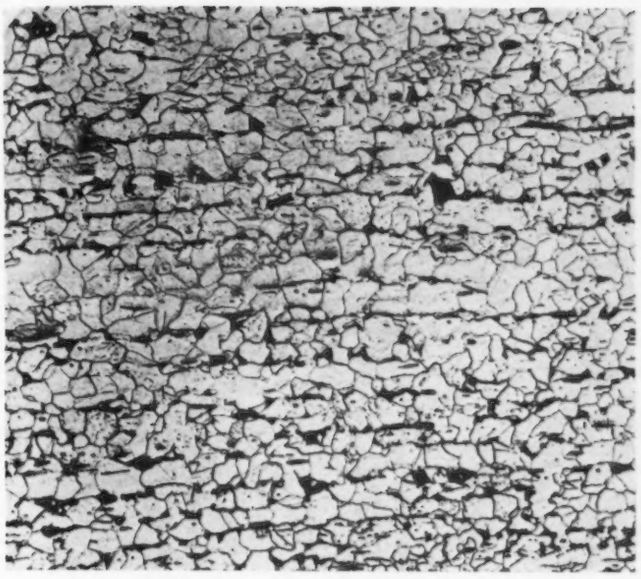


FIG. 2—Photomicrograph of the S.A.E. 1112 steel used in these relative machinability tests. Magnification, 300X.

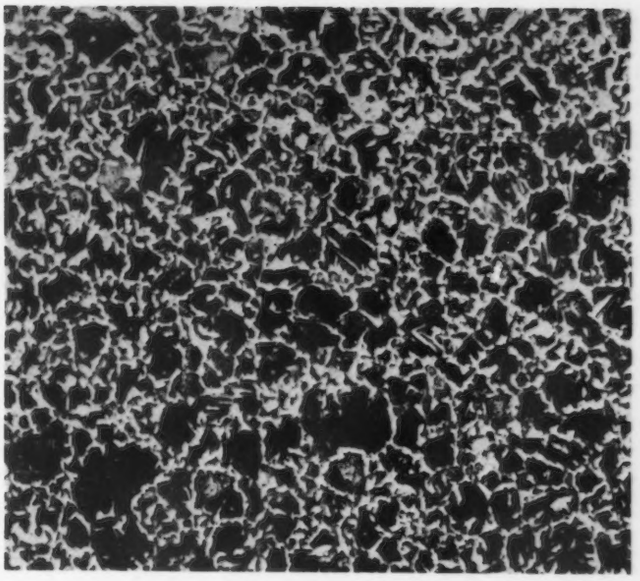


FIG. 3—Photomicrograph of the S.A.E. X-1335 steel. Magnification, 300X.

wearing off of the clearance angle necessitates regrinding of the tool.

Cut No. 6 was then attempted, but the tool failed after cutting a distance of ¼ in., indicating that 100 ft. per min. cutting speed is too high. From Table I it will be seen that in this test the horsepower required was not much greater than that of the Nos. 1112 and 1335 steels.

The character of finish in the case of this and all other tests tells something about the machinability. In some shops high finish is of primary interest; in others, machinability is thought of mainly in terms of rapid metal removal. We know that steel hardnesses most satisfactory for lathe operations are not necessarily good for cutting of gear teeth which, when not subsequently finished by grinding, must be cut smooth. You don't want to have to vary the condition of the steel between turning and gear cutting, so you compromise in favor of the gear cutting. In this case machinability may be thought of in terms of finish.

The next cut, the seventh, was on the same steel but heat treated to a hardness of 241 to 285 Brinell. When the materials get harder the chips get shinier, and in this case there was a brilliant shine on the back of the chip. A little more than 5 cu. in. were cut per min.; using 6 hp. this is a little more than 1 cu. in. per min. per hp. At 100 ft. per min., the tool hardly started; it failed after 1/16 in. A long series of tests would be necessary to establish the maximum speed at which these tools could be run for satisfactory cutting. But as the time available for the entire demonstration was very limited, we were only able to play with extremes.

In testing at 50 ft. per min. the S.A.E. 4145 steel in the "as rolled" condition the tool failed after ¾ in.

FIG. 4—Photomicrograph of the S.A.E. 4145 steel, fine grain, annealed. Magnification, 3000X.

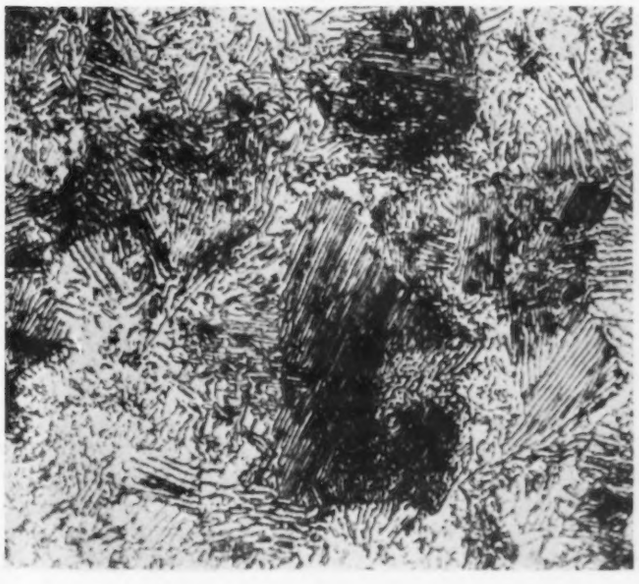
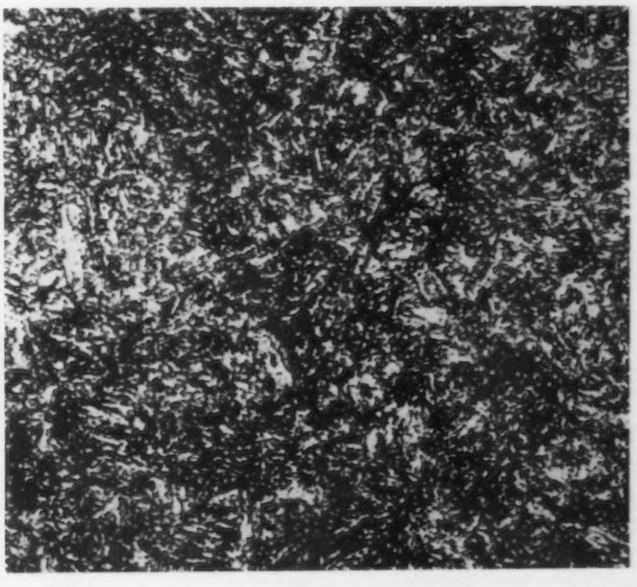


FIG. 5—Photomicrograph of S.A.E. 4145 steel, fine grain, heat treated to 302 Brinell. Magnification, 3000X.



That is why you buy this steel annealed. As this cut was not successful, the 100 ft. per min. test on the "as rolled" steel was not attempted.

Photomicrographs of these alloy steels in the three different conditions are reproduced in Fig. 4, 5 and 6. The magnification is 3000X, the laboratory having in this case stepped up the magnification 10 times to show plainly what the grain structure looks like.

Fine Vs. Coarse Grain Steel

The next step in these demonstrations was one involving delicate shading of colors—so to speak—a differentiation between fine grain and coarse grain steel.

A large number of metallurgists say that the coarse grain steel is more easily machinable; others say that as between fine and coarse grain, it doesn't make much difference.

However, we were unable to get a bar of coarse grained No. 4145 steel, the mill reporting that they had not run any in recent years. So we had to take one of a little different analysis, namely, S.A.E. No. 3145 coarse grain in the annealed condition. Thus we were forced to put another variable in this test.

One physical property of fine grain steel in which both machine tool builders and users are interested, is high impact strength. With a gear having high hardness and an Izod impact value of 10 ft.-lb., we have a few foot pounds to play with. But when the impact value is cut down to 5, we are afraid of it. With an intermediate hardness, and impact values of 70 to 80 ft.-lb., a change to 70 to 50 ft.-lb. doesn't usually make a great deal of difference. Steel makers are investigating medium coarse grains to see if they can produce better machinability in alloys. Naturally, we would welcome any improvement in the machinability of these steels.

Results of our tests on this No. 3145 coarse grained steel are shown in the 11th and 12th items of the accompanying table. In cut No. 11, a long continuous chip was formed, longer than any of the previous chips. In ordinary practice the lathe operator would either stop the feed and break the chip and get rid of it, or he would grind a crater in his tool. Chips broke short when nearing 6 in. In the same steel at 100 ft. per min., the tool failed after ¼ in.

The difference in alloys in the No. 3145 steel as compared with the No. 4145 steel may have been the reason that this test was not satisfactory. The comparison, therefore, is not direct. A photomicrograph of the steel is reproduced in Fig. 7. It was quite surprising to us that this steel in the annealed condition showed this difference in grain size. The patches look considerably larger than they do on the No. 4145 annealed fine grain steel (Fig. 4).

Machinability Remains Constant for Higher Speeds

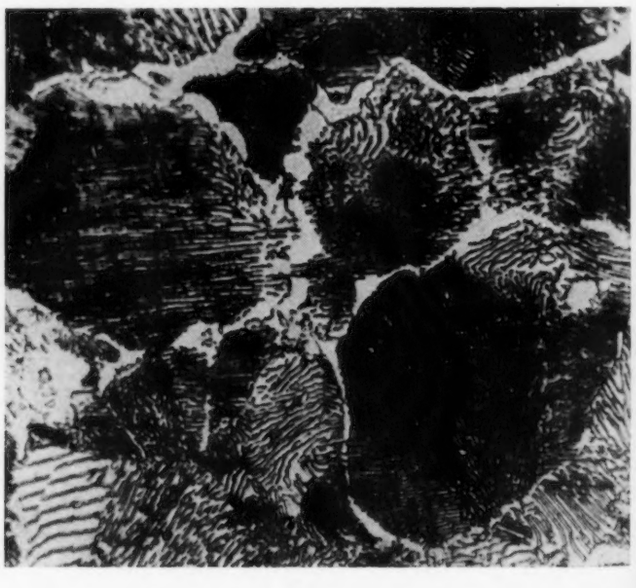
The damage to the tools, the length of the cut obtained, etc., undoubtedly tell something of the relative machinability of the various steels, even with these few tests. It should be reiterated that the entire demonstration was performed under what might be termed common conditions. There might be a method of making a particular steel machine better by changing tool angles, but we were not attempting to find the optimum condition for any class of steel. We followed existing shop practice and confined the demonstrations accordingly.

Our general experience has been that the relative machinability of these materials remains constant for the higher speeds, as when using such tool materials as cemented carbides. Although the tests were performed at 50 and 100 ft. per min. with high-speed steel tools, the same materials might be cut successfully at 300 ft., or even 400 ft. The cut feet is to some extent dependent upon the depth of cut as it affects the amount of the work to be done and the amount of heat generated, and hence the abuse of the tool. Any practical lathe hand knows that on a fine cut he can speed up and that on the heavier cut he has to slow down.

Whereas this demonstration shows the relative machining characteristics of the materials tested, it is not to be taken as a criterion as to the ultimate in lathe practice. Different types of cutting tools can perform in a different manner than we have shown here. In other words we based the demonstration on the common method of cutting steel—that is, with 18-4-1 high-speed tools—but the common method is not to be taken, of course, as necessarily the last word.

FIG. 6—Photomicrograph of S.A.E. 4145 steel, fine grain, as rolled. Magnification, 3000X.

FIG. 7—Photomicrograph of the S.A.E. No. 3145 steel, coarse grain. Magnification, 3000X.



Getting the Most Out of Budgetary Control

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By FRANK KLEIN

Director of Budgets, Worthington Pump & Machinery Corp.
and
Past President New York Chapter of National Association of Cost Accountants

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FOR profits in the Metal Working World of Tomorrow the executive must consider budgetary control. If he has not done so he has usually left a big stone unturned in his path to an adequate return on volume and investment. Frank Klein, author of the accompanying article on budgetary control has been with the Worthington Pump & Machinery Corp. for the past 12 years, since 1927, in the capacity of director of budgets. He is an authority on this subject and a member of the advisory committee on accountancy to the New York World's Fair.

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IF you were to ask a group of your business friends how many of them used budgets in their organizations, you would probably find that only one out of every four to six firms employed budgetary controls.

If you inquired why the others did not use budgets you would likely hear that their business "was different," or that their sales volumes could not be predetermined correctly, and hence budgets based on any forecasted volume would be useless.

We need only point out, for the first mentioned reason, that budgeting is merely reducing to written specifications the plans of a business for earning its required profit. Surely management, regardless of the type of business, must be informed in advance whether its proposed or probable operations will result in a loss or a satisfactory profit.

To those who reason that budgets are impractical because their business fluctuates, we direct attention to the more modern developments in budgetary control methods that make automatic provision for any changing volumes that may be encountered.

We must conclude then, that the majority of those who have not yet adopted formal budget controls to their operations, either have not fully considered the possibilities and advantages of a modern budget or, perhaps, have only heard of the impractical nature of the outmoded fixed type of budget. The purpose of this article is to outline how a budget can be formulated to fit *your* business, to serve as a control of costs, expenses and profits, and, incidentally, to yield a number of other by-product controls and data not ordinarily connected directly with the subject of budgets.

Usually the plans of any business begin with the expectation of making sales. These expectations may represent only hopes, or they may be based on a definite sales forecast. By forecast we do not mean to read the future from a crystal, but to calculate and plan beforehand, using as a basis a survey of all the known pertinent facts, and adjusting these by the indicated trends.

For instance, in a consumer goods industry a study might be made of population growths, territorial purchasing power, adaptability of the various products to geographic sections, competitor coverage, and the economic trend, from which would be computed the sales quotas for each line of product, and by each territory or divisional office. These volumes would, in turn, become the responsibility of each product sales manager, and of each territory or divisional manager, who would assign individual sales quotas to each of his salesmen or dealer representatives.

Or consider a durable goods business where products are built to the customers' individual orders. Here a survey of customers' probable needs would be made by requesting of each district or territorial manager an estimate of his coming year's business. These managers would, in turn, ask each of their salesmen to survey their prospects for future business, analyzed by type of product. These estimates would then be reviewed by general sales executives, having in mind past

actual results and indicated future trends, not only in general, but also by the several types of industry that purchase the products.

The Sales Expense Budget

One of the prerequisites for effective control of all operations is (a) the assignment of the type and volume of work to be performed, and (b) the allowance of the proper amount of cost or expense for performing the stated work. This is equally true whether it relates to sales, administrative, or shop departments.

In accord with this policy, each district manager would also prepare an estimate of his expenses necessary to obtain the proposed volume of business. This would be done by listing in detail his requested expense allowances. The booking quota would then be related to the requested expense allowance, to determine the proposed direct sales cost for each district office.

Similar types of expense budgets would be requested by each general sales department, after which a summary would be prepared for all sales offices and departments to determine the total requested expense allowance for obtaining the stated volume of business.

Ordinarily the year's quota and expense budget would be deemed to be uniform throughout the year, and one month's portion would, therefore, be one-twelfth the annual total. If, however, the business were seasonal, separate quotas and their incidental expense requirements would be established for each of the seasons with which volume regularly changed.

The Administrative Expense Budget

In a business where production and billings are not apt to be greatly different from the volume of business booked, it is likely that the various administrative expense requirements will be gaged by the volumes indicated by the sales quotas.

In such a case the administrative expense budgets would be prepared along lines similar to those used for expense budgets.

It will be noted that both the sales and administrative expense budgets are of the fixed type. For the entire year, or any given season, the amount of expense provided for performing the job will remain constant, even though the volume of work may vary from that originally specified.

For instance, business booked may be more or less than the quota for any month, yet this may not measure the proportionate need for expenses. A sales campaign may be initiated in the first month, the results from which are not felt until later. Salesmen may be making contacts, submitting bids, and doing other sales promotional work that practically sells several large jobs, but which for special reasons are not booked until some weeks later. Under such conditions it is not possible to measure the need for selling expenses by the volume of business booked over short periods, so a fixed amount of sales expense is provided with the knowledge that some upward or downward adjustment may have to be made after several months, if actual volumes booked should be radically different from the quotas.

The Manufacturing Budget

The total proposed sales quotas, having been compiled by lines of product, may now be segregated according to types manufactured at each plant. For instance, the quotas for all kinds of pumps may be $15,000,000 and would be processed at the pump works; compressor quotas might total $5,000,000, which would be manufactured at the compressor works; and so on until all sales quotas have been allocated to their respective plants. The same principle of allocation by products would, of course, apply if several products were processed in different departments of a single plant.

A question now arises as to whether the proposed sales quotas, on which selling effort is to be directed, and advertising campaigns planned, can be produced at their respective plants, and with what profit results.

It is first necessary to ascertain the current inventory situation and the policy regarding future manufactured stocks that are to be carried. Shall some of the present stocks be applied to customers' orders without replacement, or are stocks already at such a dangerously low point that a larger inventory is warranted?

Consideration of the proposed sales quotas plus the desired inventory increases, or minus decreases, will indicate the required volume of production for each plant. Given these volumes: To what extent will the productive facilities be utilized at each plant, and what amount of plant investment will be idle?. Does the proposed rate of operations for each plant represent an economic load, or should there be a better distribution of the volume between the several plants? Will each plant earn its required share of profits, and if not, what must be done to assure this?

These and similar questions can be answered by management with the aid of data available in the type of manufacturing budget described herein.

The Plant Capacity

The capacity of any plant to produce is, of course, limited by the amount of its productive facilities, which may be machine tools, work benches, foundry cupolas, and any other type of equipment provided for the productive processes.

The use of such productive facilities is further limited, usually, to the standard work week prevailing in the industry or geographic section, so that it is customary to consider the capacity of the plant to produce by the amount of product that may be fabricated on the productive facilities during a standard week of, say, forty hours.

If products of uniform nature are processed by certain departments or machines it is a simple matter to convert departmental or machine capacity into terms of pounds, yards, gallons, or pieces of the product.

If, on the other hand, the product is built to the customer's specification, so that many different job orders are processed on the same productive equipment, it is necessary to designate some uniform measure of output such as productive labor hours or work units.

In either case, the objective is the determination of the 100 per cent capacity of each department, and the plant as a whole, to produce in terms of common units. These capacities, stated in terms of yards, pounds, or productive work units, can then be converted into the billing values which they represent, so that the capacity of a plant to produce both physical work and its corresponding billing volumes will be known.

It is obvious that if the actual number of pounds, yards of productive work units produced in any week is related to the 100 per cent capacity of any department, or the entire plant, the percentage of capacity worked will be shown, and conversely, the extent to which the plant was idle will be known.

The Variable Expense Budget

After the productive facilities of a department have been determined, a study should be made of each type of expense, and its requirement in connection with the productive processes.

This might be done by taking the present rate of operations as a starting point, analyzing the actual expense requirements for that level, and then providing for increases or decreases in each class of expense as the study indicates to be necessary with higher or lower volumes.

By using a ruled form it is possible to provide separate columns for reasonably small steps of operating capacities over the range in which operations are likely to fluctuate. For instance, eleven columns would provide space for a range from 50 per cent to 100 per cent in even steps of 5 per cent capacity. In each column the amounts of the various kinds of expenses incidental to the respective rate of capacity would be listed.

Instead of the individual variation of each class of expense with operating capacity, some organizations attempt to segregate all expenses into two groups—fixed and variable—allowing the fixed amount regardless of capacity worked, and a directly proportionate increase or decrease of the variable amount when capacity changes.

Our purpose is not to compare the relative merits of each method, but merely to direct attention to the need for

1st, Providing a measure of the capacity of the department to produce, and

2nd, Determining the proper expense allowances for the respective rates of operation.

Having provided variable expense allowances for the productive departments, based on the various volumes of work that may be required of them, it is logical that the study of expense requirements of the so-called service or indirect departments be made on a similar basis. Therefore, the activity of any indirect department is related to the department or departments it services. Thus, an internal transportation system functioning for the entire machine shop, and not charged directly to any one machining department, would have its activity based on the total capacity of the combined shop departments, while the stores and accounting departments would be based on the entire plant activity.

When expense budgets for all direct and service departments have been completed, a summary for the entire plant will show the various stated percentages of capacity, the number of productive units incidental to such capacities, and the plant expense necessary for operating at any of the given capacities.

Burden Absorption at Various Capacities

With the data available from our variable plant expense budgets, it is possible to prepare a tabulation that will show the total plant expense incidental to any rate of operating capacity, the corresponding amount of burden absorption, and the amount of under or over absorbed burden resulting from each of the stated capacities. Such a table might appear as follows:

X X WORKS
BURDEN ABSORPTION AT VARIOUS CAPACITIES
PER WEEK—1939

Operating Capacity	Productive Hours	Controliable Expense Budget	Fixed Charges	Total Works Expense	Absorption @ $.88 Per Prod. Hr.	Under- *Over* Absorbed Burden
50 per cent	10,640	$10,679	$1,929	$12,608	$9,363	$3,245
55 " "	11,704	11,187	1,929	13,116	10,300	2,816
60 " "	12,768	11,645	1,929	13,574	11,236	2,338
65 " "	13,832	12,079	1,929	14,008	12,172	1,836
70 " "	14,896	12,520	1,929	14,449	13,108	1,341
75 " "	15,960	13,010	1,929	14,939	14,045	894
80 " "	17,024	13,356	1,929	15,285	14,981	304
85 " "	18,088	13,676	1,929	15,605	15,917	*312*
90 " "	19,152	13,974	1,929	15,903	16,854	*951*
95 " "	20,216	14,282	1,929	16,211	17,790	*1,579*
100 " "	21,280	14,557	1,929	16,486	18,726	*2,240*

It will be noted that this is a statistical summary compiled by using the total plant expense budgets for each of the established capacities, computing a weighted average burden rate for the entire plant and multiplying this rate by the number of productive hours at each capacity; the difference between the total expense and burden absorption representing the amounts of under or overabsorbed burden.

It will be observed, in the example shown, that controllable expense, including all expenses other than depreciation, insurance and fixed taxes, increases or decreases only about two-fifths as fast as production. It is the somewhat fixed nature of the other three-fifths of controllable expense, plus the regular fixed charges, that causes under or overabsorbed burden to result when volume changes.

The Works Operating Budget

In most industries direct labor and materials are required in direct proportion to the volume of business being processed. It is true that some direct labor savings may be realized on set-up time for economic lots, but for a statistical tabulation, such as we are discussing we may omit it from consideration.

If we, therefore, determine the amount of direct labor and material required to produce one unit of product, or one billing dollar, this relationship will remain constant regardless of the volume processed; and since we have already computed the manner in which plant expense varies with volume, we are now in position to combine these to show the operating results that may be expected from various amounts of production.

For instance, it may be found that the product of the X X Plant requires an average of $0.32 direct material, one-quarter hour direct labor costing $0.20, and on which would be applied burden of $0.22, representing a total normal shop cost of $0.74 for each dollar of billings produced. With such data the following table would be prepared:

Using the Statistical Data

When similar tabulations, showing income at various capacities, have been prepared for each of the plants, the following interesting data are available:

1. The extent to which each plant will be required to operate to produce the quotas.

   Without such information, quotas are sometimes set that require unduly high capacities at one plant, and exceptionally low operations at another, resulting in uneconomic operations at both. With such data, sales effort can be directed toward getting a reasonable load for each plant.

2. The percentages of shop profit that will result at each plant for a uniform rate of capacity.

   One plant may consistently show a lower profit than another, and the explanation may be given that it is due to lower operating levels. A comparison of the percentage of budgeted profit for each plant at, say, 85 per cent, will place all plants

on an even basis so far as comparative results are concerned.

3. The trend of profits for the coming period.

Sometimes the extent to which gradually increasing costs and expenses are reducing profit margins is not realized until they reach the billing stage several months later. By calculating these in advance, the necessity for certain sales price adjustments may become apparent in time to maintain the desired margin between costs and billing prices.

4. The effect of volume on profits.

The additional profits resulting from higher volumes, and the penalty that will result from failure to obtain quotas, is readily apparent. If volumes realized are substantially lower than the quota, the extent to which controllable expenses must be reduced to preserve the profit margin is indicated; if volume is greater, there is a check on rising expenses to prevent loss of the benefits arising from the increased capacities.

5. The need for corrective steps when indicated profits are unsatisfactory.

If, instead of the satisfactory profit results indicated in our example, a loss or a substantially reduced profit were forecast, the specific controls for each of the cost and expense elements would be further studied and revised. Can material costs be reduced? Are purchasing methods efficient? Are direct labor controls effective? Can expenses be reduced by simplification of routine or through other means? How about scheduling of the product? Are spoiled work costs at a minimum? These and other questions are naturally considered where a study is systematically and regularly made for improving profit results.

Operating the Budget

After the indicated profit result has been approved as satisfactory, the various budgets then become the commitments of the respective division and department heads for their responsible share in attaining the profit objective. In addition to each salesman, district manager, foreman and department head receiving his budget allowance for the volume of work he is expected to perform, certain budget consolidations are made to show the results for each works, and for the entire business. An example of a works operating budget and actual comparison would appear as follows:

Assuming the annual quota to be $3,541,000, the operations for one month would be one-twelfth of each of the corresponding costs and results shown on the tabulation of annual net income at various capacities for this plant. Under the old type of fixed budget, this would be compared with the column actual results, and management would probably be satisfied because profits were $36,347, instead of the budget profit of $28,192.

But now note the variable budget column, which shows that the plant actually operated at 90 per cent capacity and billed $331,968. For this volume the variable capacity table shows that overabsorbed burden of $4,121 should have occurred, with a net plant profit of $43,220. Actual results are, therefore, compared with the budget for the actual volume worked, with the result that works

X X WORKS

BUDGETED AND ACTUAL OPERATING RESULTS

MONTH OF JANUARY, 1939

	Fixed Budget	Variable Budget	Actual Result	Under-*Over* Variable Budget
Billings	$295,083	$331,968	$331,968	.....
Capacity Worked, per cent	80	90	90	.....
Normal Shop Cost	$218,361	$245,656	$249,389	*$3,733*
Unabsorbed Burden*	1,317	*4,121*	*2,008*	*2,113*
Total Shop Cost	$219,678	$241,535	$247,381	*$5,846*
Gross Trading Profit	75,405	90,433	84,587	*5,846*
Selling and Administrative Expense	47,213	47,213	48,240	*1,027*
Net Profit	$28,192	$43,220	$36,347	*$6,873*
*Works Indirect Expense	$66,235	$68,912	$70,892	*$1,980*

X X WORKS

ANNUAL NET INCOME AT VARIOUS CAPACITIES

BASED ON 1939 BUDGETS

Operating Capacity	Productive Hours	Billing Production	Direct Material Cost @ $0.32	Direct Labor Cost @ $0.20	Normal Burden @ $0.22	Under-*Over* Absorbed Burden	Total Shop Cost	Gross Trading Profit	Sales & Administrative Exp.	Net Profit or *Loss*
50 per cent	553,280	$2,213,120	$ 708,198	$442,624	$486,886	$168,740	$1,806,448	$ 406,672	$566,560	*$159,888*
55 " "	608,608	2,434,432	779,018	486,886	535,575	146,432	1,947,911	486,521	566,560	*80,039*
60 " "	663,936	2,655,744	849,838	531,149	584,264	121,576	2,086,827	568,917	566,560	2,357
65 " "	719,264	2,877,056	920,658	575,411	632,952	95,472	2,224,493	652,563	566,560	86,003
70 " "	774,592	3,098,368	991,478	619,674	681,641	69,732	2,362,525	735,843	566,560	169,283
75 " "	829,920	3,319,680	1,062,298	663,936	730,330	46,488	2,503,052	816,628	566,560	250,068
80 " "	885,248	3,540,992	1,133,117	708,198	779,018	15,808	2,636,141	904,851	566,560	338,291
85 " "	940,576	3,762,304	1,203,937	752,461	827,707	*16,224*	2,767,881	994,423	566,560	427,863
90 " "	995,904	3,983,616	1,274,757	796,723	876,396	*49,452*	2,898,424	1,085,192	566,560	518,632
95 " "	1,051,232	4,204,928	1,345,577	840,986	925,084	*82,108*	3,029,539	1,175,389	566,560	608,829
100 " "	1,106,560	4,426,240	1,416,397	885,248	973,773	*116,480*	3,158,938	1,267,302	566,560	700,742

In explanation of these figures, it should be noted that the productive hours shown for each capacity are those taken from the weekly burden-absorption table increased to an annual basis; the billing-dollars are four times the productive hours since one-quarter hour is required to produce a billing-dollar; the direct material and labor costs are the predetermined percentages of the billing-dollar; normal burden which is applied on the productive hour represents one quarter of the weighted average absorption rate; under or overabsorbed burden is taken from the weekly burden absorption table increased to an annual basis; the normal burden plus the underabsorbed, or minus the overabsorbed burden, of course, agrees with the total plant expense also shown on the absorption table, when increased to a yearly basis. The sales and administrative expenses are those required to secure the quota of say $3,541,000 which represents 80 per cent of the plant capacity.

normal costs are found to be $3,733 worse than the budget; overabsorbed burden is $2,113 less than it should be, and reference to the footnote shows that $1,980 is due to works indirect expenses exceeding the budget; while sales and administrative overexpenditures of $1,027 further reduces the profit. Here, then, is the simple story our comparison tells:

The billing quota of	$295,083	required a profit of	$28,192
Additional billings of	36,885	justified additional profits of	15,028
Actual billings of	$331,968	required a profit of	$43,220
Actual profits for the month amounted to			36,347
The reduced profit requiring further study and attention is			$6,873

The above comparison would be varied slightly if production were at a rate different from billing volume due to an increase or decrease of manufactured inventories. In such case the normal shop cost would be the fixed percentage of $0.74 for the amount billed, while the absorption figure would be the budget for the actual capacity worked. Some other possible variations will, no doubt, occur to the reader in adapting such a plan to his own organization's requirements.

This discussion has thus far dealt principally with the mechanics of establishing a profit and loss budget together with certain auxiliary controls. It is apparent that with this data as a basis, a cash and balance sheet budget could also be compiled, so that the entire progress of the business would be planned and charted by its forward looking executives.

The Human Factor

While we have covered the methods of accumulating data in connection with a complete budget, we should not fail to consider also the change in psychology that occurs as a result of this work.

Management for the first time, in some cases, deliberately plans its business progress for the future, and all contemplated actions are considered and weighed with regard to their effect on the planned objective.

Salesmen, foremen, department heads—all must consider not only the production aspects of their jobs, but also their cost.

With individual budget reports for each supervisor, the economies of one department are not submerged in the wastes of another; each knows that his individual results will be recognized.

The constant focusing of attention on the profit goal throughout the entire organization by means of the various budget controls, and the steps taken to insure adherence, gradually create in the personnel the feeling that something *can* be done about unsatisfactory operating results. This concentrated thought devoted to cost and expense control problems leads to the formulation of solutions, even before such problems have a chance to be recorded in the financial statement as losses or reduced profits.

Surely our friends who have not yet adopted budgets must agree that such results are desirable, no matter how "different" their business, and that their operations can be controlled, even though volume may fluctuate.

Give an intelligent management an effective budget control, and watch the profits grow!

o o o

THE purpose of the machine shown, which is a product of the Mathews Conveyor Co., is to tilt a pack of sheets at such an angle as to make it convenient to remove one sheet at a time to a belt conveyor feeding a cold mill. The packs are received in a horizontal position and are tilted through an arc of 75 deg., placing the pack in an angle 15 deg. from vertical. The packs handled are 74 in. wide, 18 in. high, and 15 ft. long, with a maximum weight of 25,000 lb. A 15-hp. motor drives the tilting mechanism and it takes about 30 sec. to complete the operation. The heavy duty roller conveyor has rollers 54 in. long, spaced at 12 in. centers and 4¼-in. diameter.

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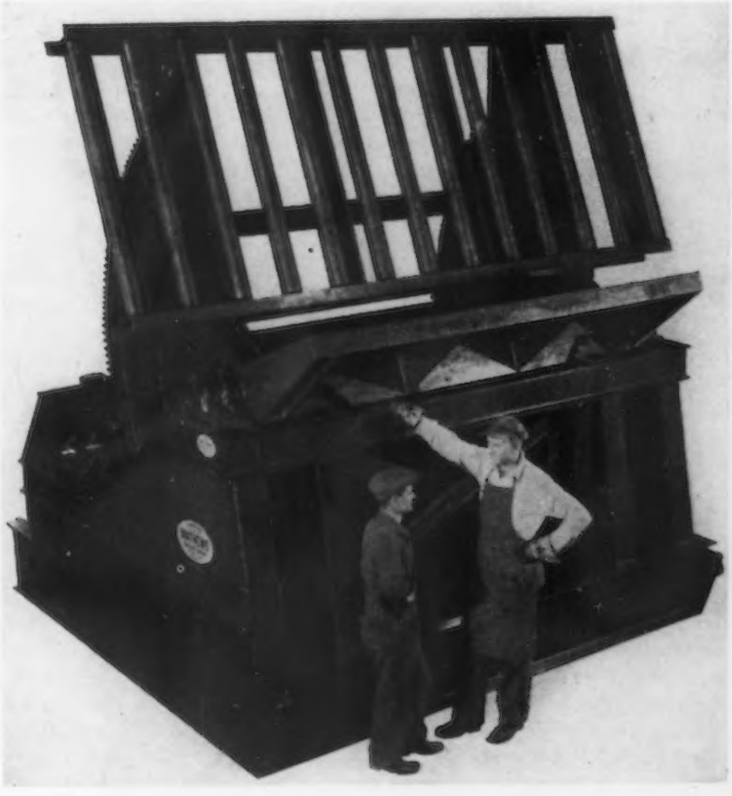

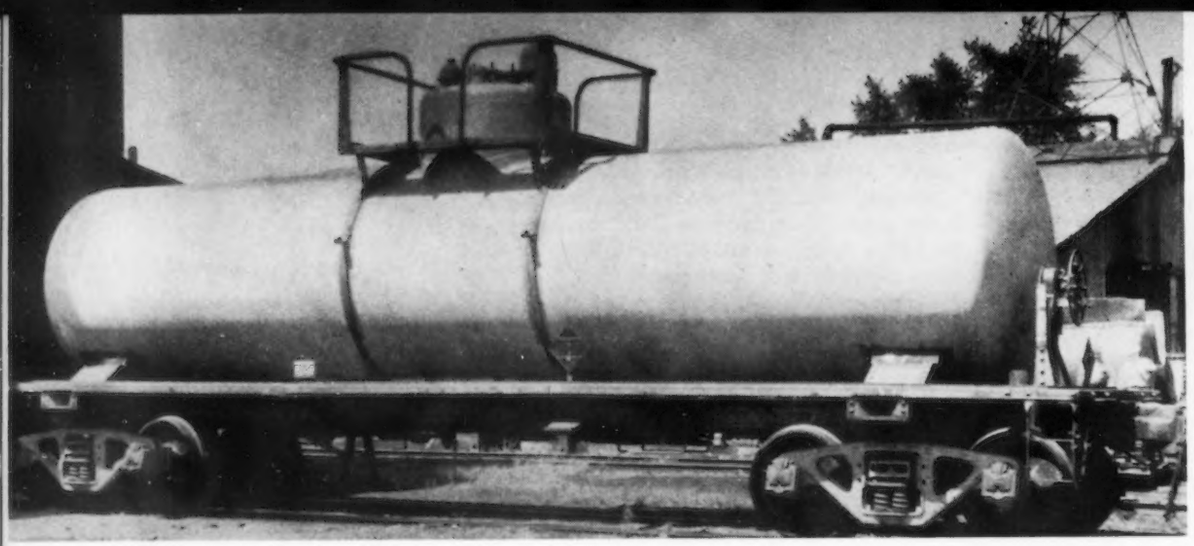

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THIS tank car for the transportation of high-purity chemicals was fabricated by welding columbium-bearing stainless steel in accordance with the A.S.M.E. requirements for Par. U-68 (Class 1) pressure vessels.

o o o

Stainless Steel for Welded Pressure Vessels

o o o

By GEORGE A. SANDS
Electro Metallurgical Co., New York

o o o

THE development of stabilized austenitic chromium-nickel stainless steels has broadened the use of these steels for welded pressure vessels.

Prior to this development pressure vessels requiring austenitic stainless steel were limited to sizes and, particularly, to plate thicknesses that could be heated to temperatures of 1900 to 2000 deg. F. and quenched rapidly enough in air or water to restore the corrosion resistance and physical properties impaired by the heat of welding and forming operations. All unstabilized types of austenitic stainless steel when subjected to the harmful temperature zone (800 to 1600 deg. F.) are susceptible to intergranular corrosion and physical impairment which is caused by carbide precipitation in the grain boundaries. A re-solution of these carbides, restoration of corrosion, resistance and physical characteristics are accomplished by high-temperature heat treatment followed by quenching in air, water, or water spray, the quenching medium depending upon the size of the vessel and the thickness of the metal. A number of all-welded vessels, the majority of which are constructed of plates less than ½ in. in thickness, have been satisfactorily heat-treated in this manner; but because of the human element and the frequent lack of suitable quenching facilities, the quenching procedure is always a problem and the results may be questionable. It is obvious that such a heat treatment is not suitable for vessels of the largest dimensions or those of large cross-section.

Another difficulty that confronted the fabricator of stainless steel pressure vessels was the problem of stress relief. In order to assure the maximum safety for pressure vessels, the A.S.M.E. Boiler Code requires that stresses set up in welding or forming of all Par. U-68 (Class I) vessels shall be relieved by heating uniformly to a suitable stress-relieving temperature and held at that temperature for a time at least equivalent to one hour per inch of maximum thickness, followed by slow cooling in still air. Indications are that a suitable stress-relieving temperature for austenitic stainless steel would be in the range of 1000 to 1650 deg. F. Slow cooling from these temperatures would destroy the valuable corrosion-resistant and physical properties of the unstabilized alloy.

After considerable research, metallurgists have overcome the above difficulties by stabilizing the low-carbon, austenitic stainless steels with the addition of less than 1.0 per cent of columbium or titanium. The stabilized alloy, which is not susceptible to intergranular corrosion, has made fabricated stainless steel pressure vessels as readily available as vessels of ordinary carbon steel. This development led the Boiler Code Committee of the American Society of Mechanical Engineers to adopt Code Regulations (Case 834) covering Par. U-68, (Class I) pressure vessels constructed of austenitic stainless steel.

To obtain the maximum benefits to both the user and the manufacturer, the stabilized stainless steels should be well balanced to form a fully austenitic structure. If the alloy is out of balance a duplex structure is formed containing austenite with a small amount of ferrite. The presence of a small amount of ferrite may make the alloy susceptible to general corrosion in the ferrite phase after subjection for long periods to the harmful temperature zone (800 to 1600 deg. F.), and has an adverse effect on the hot working and welding properties. In other words, the additional ferrite forming elements, columbium or titanium, should be compensated for by the addition of austenite forming ele-

ments, such as nickel, to keep the structure fully austenitic. It has been found in the fabrication of these steels that from 1.0 to 2 per cent of manganese is of special value in improving the hot working, forming, and welding operations.

Because titanium oxidizes so readily at high temperatures columbium-bearing rod should be used in welding. The welding rod should be of such a composition that the deposited metal would conform to the composition of base metal. Allowance must be made for slight losses of the oxidizable elements in the rod. In addition to the required amount of columbium (8 to 10 times the carbon content in deposited metal), about 2 per cent of manganese and 0.70 per cent of silicon are recommended in the rod composition. The manganese produces cleaner, sounder and more ductile welds; and the silicon, which is about 0.25 per cent more than normally used, gives better recoveries of columbium in weld metal.

Among the many new applications that have been made more feasible by the development of the stabilized composition is the use of stainless steel for all-welded tank car construction. Although a tank car is not strictly a pressure vessel, the hazards involved in railroad transportation made it advisable to specify its construction in accordance with the A.S.M.E. Boiler Code, Par. U-68, for pressure vessels. For the purpose of confirming data already available, approval of the Tank Car Committee of the Association of American Railroads and the Bureau of Service of the Interstate Commerce Commission was granted for the construction of five 8000 gal. tank cars, one of which is now in service.

The tank and appurtenances of this car were made of low-carbon, austenitic stainless steel of the 18-8 type containing ten times as much columbium as carbon. The tank was approximately 33 ft. long by 6½ ft. in diameter, and was assembled from three shell plates and two dished single piece heads approximately ½ in. thick. The shell plates were rolled from ingots weighing 5900 lb. each, and the resultant plates were the largest ever made of columbium bearing 18-8 stainless steel. The main body of the tank was fabricated with longitudinal "V" type welded seams and with four welded circumferential seams, which unite the five main pieces so that the longitudinal seams of the shell are staggered. The longitudinal anchors were made of two "T" section bars with the curved tops of the "T's" integral with the bottom of the shell. This method of welding the anchors into spaces prepared for them in the tank wall is unique with this car. The anchor bars are approximately 6 ft. long and are provided with rivet holes for attaching them to the car truck.

After the welding and stress relieving, sandblasting and pickling operations were carried out in order to eliminate the possibility of any free iron being present on the interior surface of the tank. A chemical test was made to verify this complete freedom from contamination and the usual X-ray and pressure tests were made in accordance with the A.S.M.E. Code.

The completed tank car is now being used by the Carbide & Carbon Chemicals Corp. in regular transportation of chemicals of high purity. The tank was built in the shop of the Hedges-Walsh-Weidner Division of the Combustion Engineering Corp.

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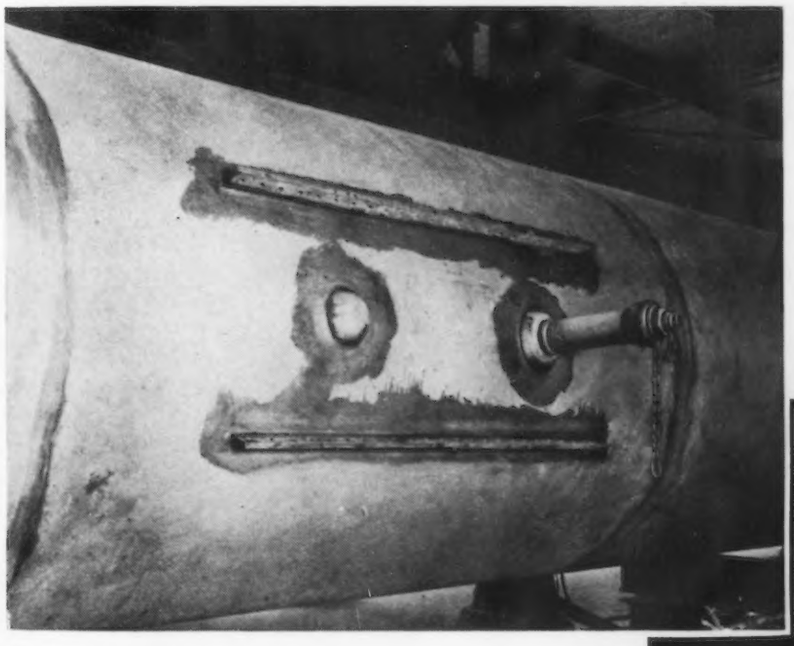
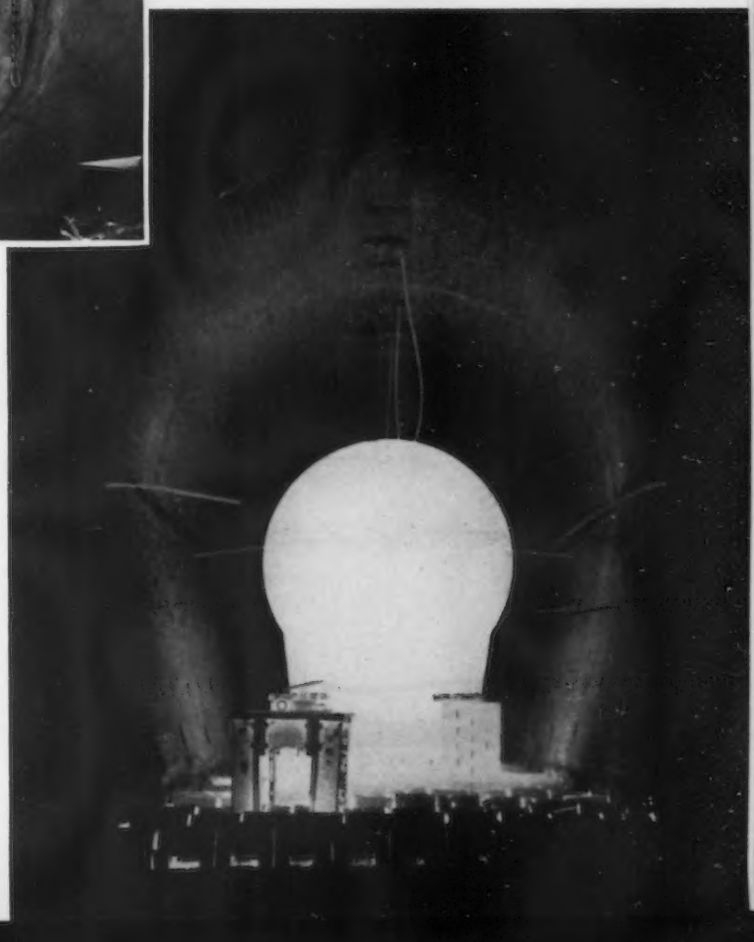


THIS columbium-bearing stainless steel tank is shown in a stress-relieving furnace. The treatment does not detrimentally affect its resistance to corrosion.

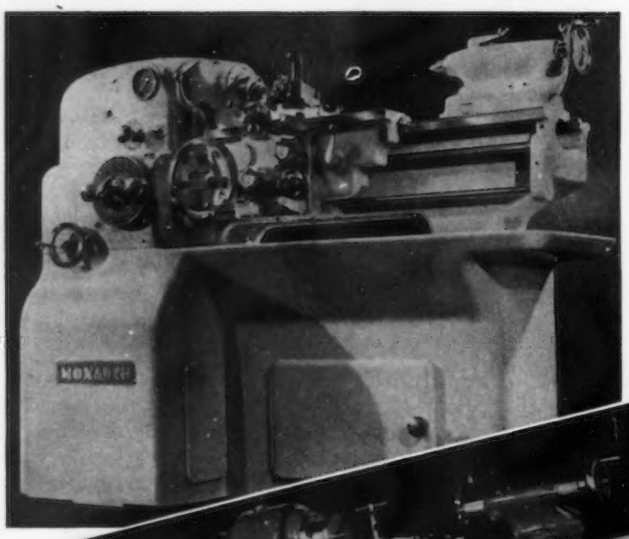


ABOVE

PARALLEL anchors, integral with the wall of the tank bottom, are shown welded in position.

o o o

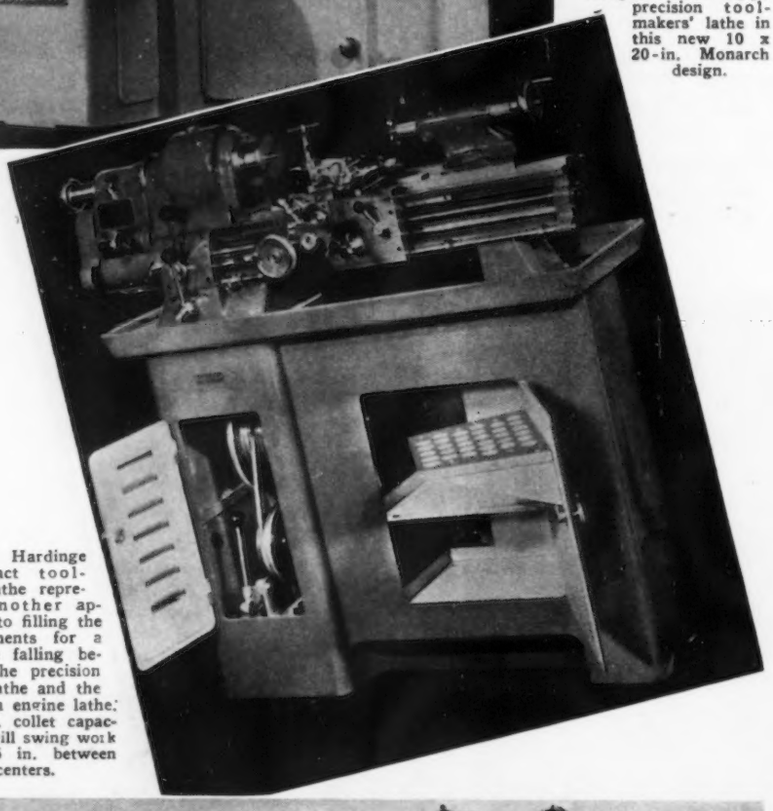
Machine Tool



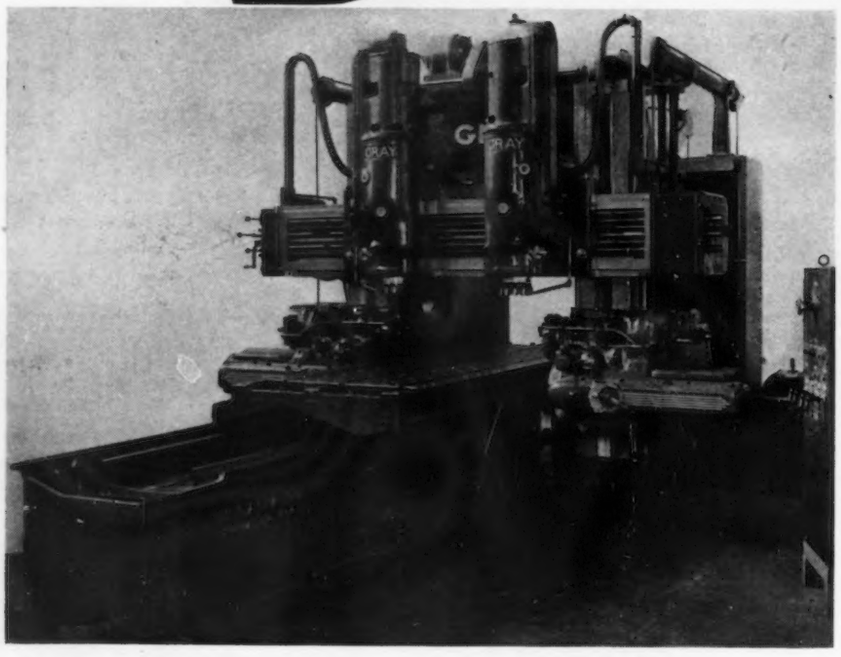
ADVANTAGES of the bench precision type lathe have been combined with entirely new functional design features of the complete floor type precision toolmakers' lathe in this new 10 x 20-in. Monarch design.

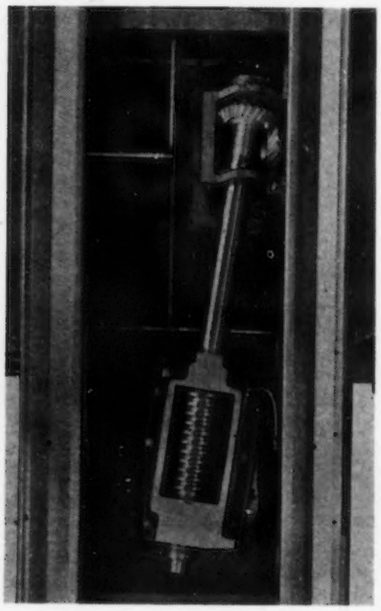
MODERN streamlined appearance characterizes the new 10 x 20-in. sensitive precision lathe just introduced by the *Monarch Machine Tool Co.*, Sidney, Ohio. Among the new mechanical design features are 100:1 infinitely variable spindle speed range, bench precision lathe accuracy in a 2000-lb., 2-hp. toolroom lathe, ease of handling all classes of work from the operator's sitting or standing position, and the use of high grade materials throughout.

Spindle speeds normally range from 25 to 2500 r.p.m. The headstock casting is precision bored to receive the hardened spindle which is mounted in three precision ball bearings. The



THE Hardinge Cataract toolroom lathe represents another approach to filling the requirements for a machine falling between the precision bench lathe and the precision engine lathe. Of 1-in. collet capacity, it will swing work 9 x 16 in. between centers.





ABOVE

TABLE of the Gray milling machine is driven by a worm gear engaging a rack. The stub shaft of the worm is driven in turn by the pair of hypoid gears, permitting a compact arrangement.

o o o

AT LEFT

THE Gray unit head type milling machine combines the speed, flexibility and ease of control of knee type millers with the power and accuracy of planer type machines.

Builders Start 1939

With Many Design Innovations

By FRANK J. OLIVER
Associate Editor, The Iron Age

A NUMBER of machines have been introduced since the first of the year intended to bring high productive capacity for small part manufacture. Two lathes are described that fall between a precision bench lathe and the heavier floor type. Two new manufacturing millers also have been designed for light duty work. Planetary drive to the unit heads is featured in a planer type miller. Most recent advance in turret lathes is a device for preselecting spindle speeds, so that shifting of gears is actuated by a secondary motion of the clutch lever. Other equipment described includes a large horizontal surface grinder, a universal tool room machine, a two-step drill grinder and small contour grinder, besides machine tool accessories.

ordinary feed drive is taken off the spindle by an endless belt, while for thread cutting the lead screw is driven through a separate gear train made of hardened gears with ground tooth contours. The quick-change gear box is operated by one handlever, and an index plate on the front permits quick selection of 50 different threads or feeds.

All rotating parts are anti-friction bearing mounted, including feed rod and lead screw. Operating steel parts are made of nickel alloy steel, electric furnace hardened. All major castings except the one-piece bed are of Meehanite metal. The bed ways are flame hardened and precision ground. The carriage is held to the bed ways by five self-alining ball bearings, mounted on eccentric studs for adjustment. The machine has a three-point bearing on the floor, giving complete stability.

AN approach from the opposite direction to furnishing a light toolroom lathe for high precision work has been made by *Hardinge Brothers, Inc.*, Elmira, N. Y. Its new high speed toolroom lathe is larger than the bench types offered heretofore, and has 1-in. collet capacity and will swing work 16 in. long and 9 in. in diameter. Through a two-speed reversible ball bearing motor, four-step cone pulleys with V-belts, and the back gears on the headstock, 16 spindle speeds, forward and reverse are provided, from 27 to 1750 r.p.m. Motor is in the welded steel base and the semi-steel bed casting rests on this base at three points, two self-adjusting steel balls at the headstock end and one at the tailstock end being provided for this purpose.

The spindle is carried in preloaded precision ball bearings. The leadscrew is also carried in preloaded ball bearings at the headstock end and a roller bearing at the other. There is a separate feed rod for power turning. The 10-change gear box and the three-change lever provide standard threads and feeds, and compounding outside the gear box extends the range.

Carriage is held to the scraped ways by a dovetail construction, said to eliminate lifting action. It may be locked in any position by an eccentric lever. One lever at the headstock gives forward-stop-reverse control of the carriage, and provision is made for carriage return at high speed. Apron is of the double wall type, with gears enclosed in grease filled chambers. Hand controlled friction clutches are used to engage power cross feed and power longitudinal feed. The cross slide has a travel of 4¾ in. and is provided with adjustable stops.

The tool post slide is mounted directly on the solid swivel base, which in turn is solidly mounted on the cross slide. The top slide is fed by a square feed screw, and incorporates a quick acting lever device for withdrawing the tool at the end of a threading cut for return of the carriage for the next cut. A taper turning attachment is also standard equipment.

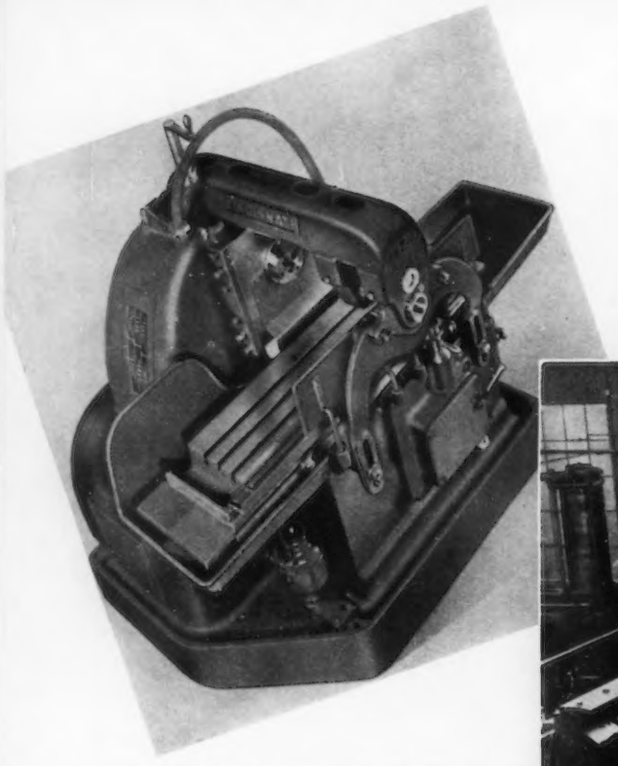
Unit Head Miller

SIMPLE and compact arrangement of planetary gearing affords 18 spindle speeds in geometric progression, ranging from 10 to 500 r.p.m., in the unit heads of a new planer type miller recently announced by the *G. A. Gray Co.*, Cincinnati. Standard spindle motor is a two-speed a.c. 10-hp. type, mounted concentric with the spindle. Speeds can be changed while the motor is running by means of two levers. The spindle runs in preloaded precision Timken bearings and is driven by a planet carrier at a point close to the lower bearing, thus reducing to a minimum the length of spindle under torsion. The flywheel effect of the heavy planet carrier tends to dampen vibrations set up by coarse pitch milling cutters. The rail head may be furnished either swiveling or non-swiveling; the side heads, non-swiveling only. Weight of the rail head is carried by spring-loaded anti-friction rollers, which relieve the guideways of the dead weight.

The standard quill travel of both types of heads is 10 in. Range of down feed and up feed of rail heads is from ⅛ to 7½ in. per min. Standard milling feeds for heads is from ½ to 30 in. per min. Feed or rapid traverse of each head is controlled independently, either at each head or at the ends of the rail. The rail itself is of rigid box section with automatic

BELOW

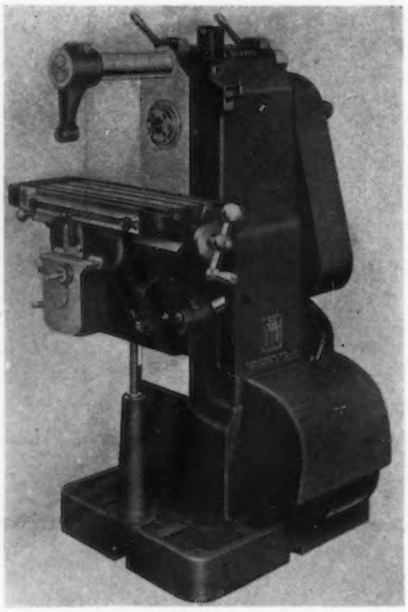
FLOOR type planers designed and constructed by the Ajax Mfg. Co., Cleveland, for its own use had to be used for planing the one-piece integral steel frame castings, weighing an even 100 tons, of a group of 2000-ton forging presses, the largest the company has yet built for automotive parts. On these planers, the work is bolted to the floor plates and the tool is carried on a traveling table, which because of its relatively light weight, can be reversed with accuracy at the ends of the stroke, materially reducing the space required for tool clearances.



A BACKLASH eliminator on the lead screw nuts enables climb milling to be performed on the new Nos. 2-18 and 2-24 Cincinnati plain automatic milling machines, the second number in the series referring to length of table travel.

leveling device and clamp action on the inside of both housings.

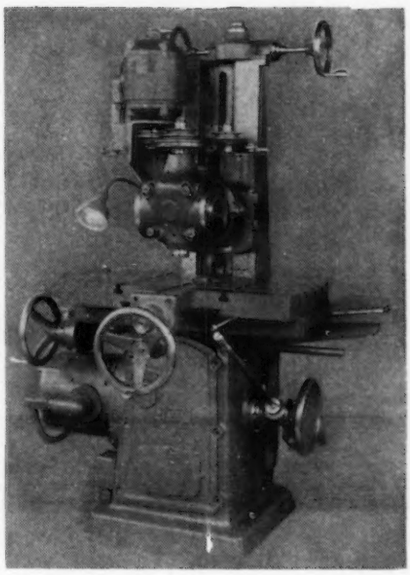
Bed is of double length so that the table does not overhang. Table is driven by rack through a worm with short stub shaft and hypoid spiral bevel pinions. The use of hypoids enables the worm to be placed high in the bed, thereby making possible the use of a small diameter worm gear without lowering the position of the table rack relative to the work. Table feeds are from ½ to 30 in. per min., controlled from either side of the table, with pendant switch for rapid traverse control.



NO. 0 is a new size Brown & Sharpe plain milling machine designed to handle medium light cuts on job-lot or small quantity production. It is similar in design to the No. OY milling machine, but does not have the semi-automatic table.

Light Manufacturing Miller

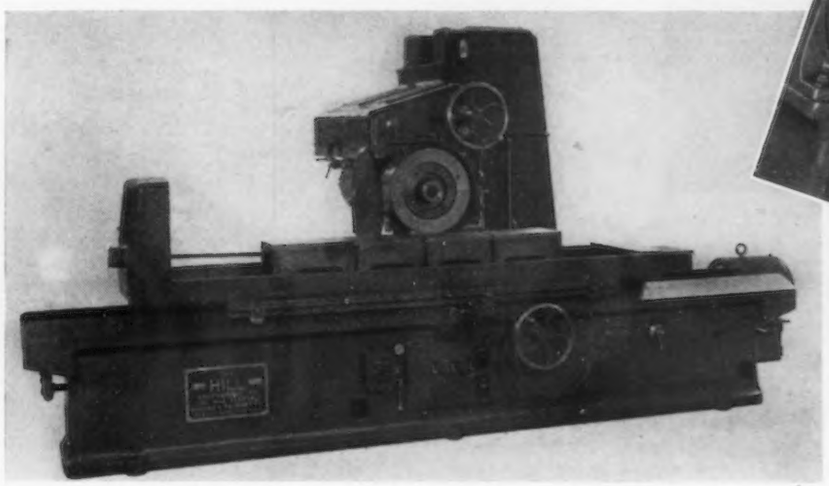
FOR the rapid production milling of medium size work, *Cincinnati-Milling Machine Co.*, Cincinnati, is offering a mechanically actuated, fixed bed type plain miller in two sizes, with table travel of 18 and 24 in. Table is driven through a lead screw, and the standard series of feeds, 1 to 40 in. per min., is obtained by pick-off gears. Dog controlled, automatic working cycles permit tripping the table at point of reversal within 0.005 in. Power rapid traverse of 250 in. per min. is standard. For climb milling, there is available a hydraulic backlash elimi-

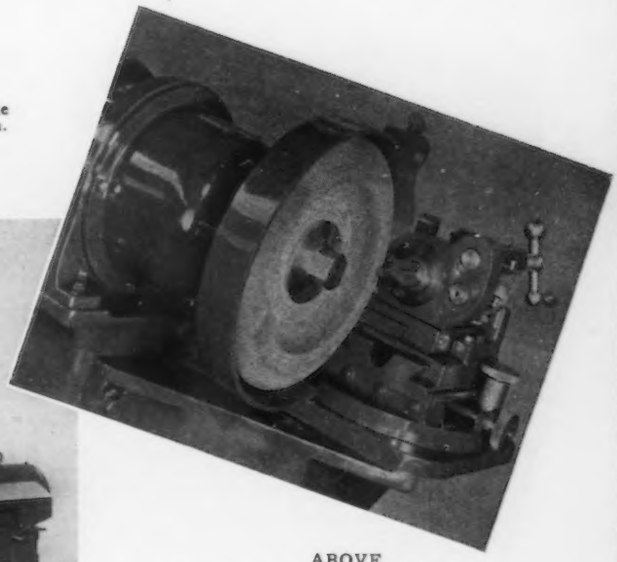


HORIZONTAL, vertical and face milling, drilling, face and internal grinding, filing, slotting and broaching can be performed in the Hack Multi-versal tool room machine. Changeover time is said to be a matter of only a few minutes from one attachment to the other.

BELOW

A NEW line of horizontal, hydraulic surface grinders is being offered by the Hill Clutch Machine & Foundry Co., of Cleveland. This is an 18 x 60-in. model.





ABOVE

THE Covel drill grinding attachment for two-step or dual drills has a capacity for drills up to 1⅜ in. diameter.

nator which wedges apart the two revolving feed nuts that engage the stationary leadscrew. This backlash eliminator is inoperative during rapid traverse.

Spindle drive is by multiple V-belt and gearing from a 5-hp. motor. By means of pick-off gears and a back gear lever, 20 spindle speeds may be selected, from 30 to 1200 r.p.m. Spindle is mounted on double anti-friction bearings, both front and rear, and has a standard nose. An automatic spindle stop is available as an extra. Actuated by a dog and plunger, it throws out the multiple disk driving clutch and applies the brake when the table reverses.

Small Plain Milling Machine

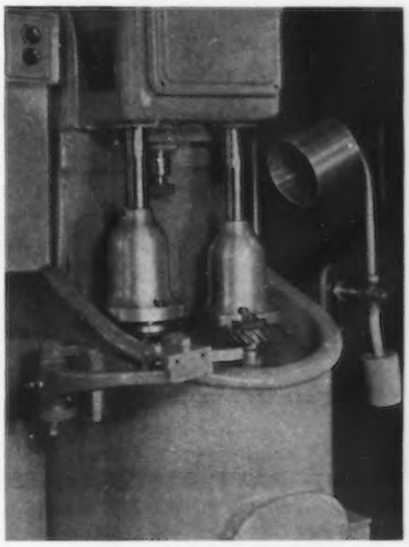
EIGHT spindle speeds from 120 to 1350 r.p.m. and 64 feeds to the screw driven table are available on the new No. 0 plain milling machine recently added to the line of the *Brown & Sharpe Mfg. Co.*, Providence. Drive from the 1-hp. motor in the base is through four-step cone pulleys and back gearing. Table feed drive is from a four-step cone pulley on the end of the spindle. A cone head drive from two-speed overhead countershaft may also be had. Gears are ground on the tooth contours for quiet operation. Transverse table feed and knee elevation is by hand.

Spindle is mounted on three anti-friction bearings, two at the front, and has a standardized end. Solid steel overarm support is provided the arbor. Working surface of the table is 22½ x 8¾ in.; longitudinal feed, 18 in.; transverse, 6 in.; and knee elevation, 14 in.

Multi-Purpose Tool Room Machine

INCREASE in size and range of work is found in the Multi-versal tool room machine, made by the *Hack Machine Co.*, 440 N. Oakley Boulevard, Chicago. The master head is a self-contained horizontal milling unit, driven by V-belt and back gears from a 1-hp. motor to give suitable speed for a 1-in. end mill to an 8-in. face mill. Height of master head spindle varies from 8 to 20 in. above the table. This master head, which serves as a carrier for all attachments, is attached to a rear cam, which can be reciprocated by a separate 2-hp. motor, with stroke adjustable from ½ to 3½ in. With proper tools, heavy duty slotting and filing can be performed, also broaching. A hack saw frame can also be attached to the master head for sawing.

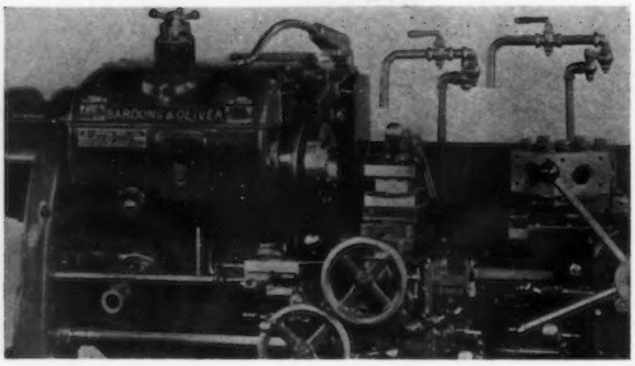
A vertical head unit is also available that can be revolved completely around the master spindle. By driving this auxiliary spindle directly from the 1-hp. motor by V-belt, spindle speeds of 750 to 2500 r.p.m. can be obtained, making it feasible to perform drilling as well as milling. Another attachment regularly furnished with the machine is a combination grinder, with two quilled spindles, one arranged to take a cup wheel, the other for small bore internal grinding.



GEARS up to 4½ in. diameter can be lapped automatically at high speed in this new two-spindle Incolap machine. The laps are under the bell-shaped housings. The pivoted can with air hose connection is swung over the work for cleaning off the abrasive by swirling air blast.

Precision Surface Grinder

AN improved line of heavy duty precision, horizontal surface grinders, with table size range from 18 to 24 in. wide and from 5 to 20 ft. long, is being placed on the market by the *Hill Clutch Machine & Foundry Co.*, Cleveland. Grinding wheels up to 6 in. are used. Table and cross feed are hydraulically operated, the latter being oscillated at a constant feed, or adjustable from ⅛ to 2 in. at each reversal of the table. A pump, driven by a 10-hp. motor, supplies oil under pressure to two opposite cylin-

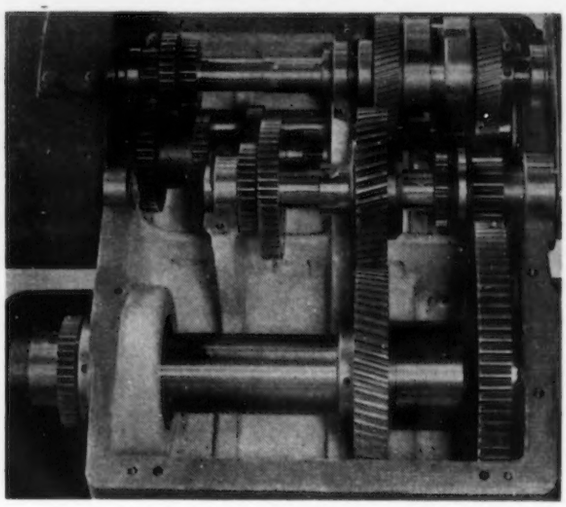


AT RIGHT

THE motor rotor on the Bardons & Oliver turret lathe is pressed on the extension of the upper jackshaft in this view and forward and reverse clutch is mounted on the same shaft. The high-low gear tooth clutch may be seen below it. In the position shown, one clutch spur gear is in mesh with the large spindle gear. When shifted to the left, the other clutch spur gear engages the hub of the helical gear, which is in constant mesh with the small spindle gear. The hydraulic shifting mechanism is not shown.

AT LEFT

A SPINDLE speed selector dial and cutting speed chart mounted on the head of this Bardons & Oliver universal turret lathe enable spindle speeds to be preselected and the gears shifted hydraulically through the actuation of the single (clutch) lever shown to the right of the dial.



ders, providing a variable table feed up to 100 ft. per min.

The wheel spindle is driven by a dynamically balanced, built-in motor, varying in size from 15 to 40 hp., depending upon the size of grinder. Power rapid elevation and lowering of the wheel head is provided by a 1-hp. motor, with hand control for final adjustment. A ¼-hp. motor is used to drive a lubricating pump supplying table ways and spindle bearings, and a ⅓-hp. motor drives the coolant pump.

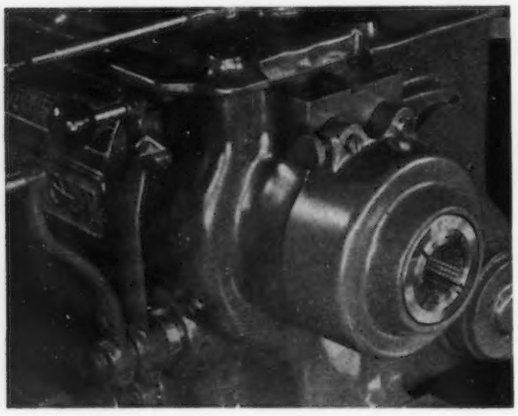
Dual Drill Grinding Attachment

DUAL drills that will drill two different diameters at the same time can be conveniently ground with the aid of a new attachment developed by the *Covel Mfg. Co.*, Benton Harbor, Mich. It can be mounted on a Yankee twist drill grinder or any other similar machine capable of carrying a 10-in. cup wheel. The attachment is first used for dressing the grinding wheel to the desired angle, mounting the diamond in the spindle of the attachment. For this purpose, the base is pivoted, and cross slides with feed screws are provided for movements at right angles.

When grinding two-lipped drills, the clearance and throw of the drill is regulated by a cam, turned by handwheel, that turns twice for each revolution of the drill holding spindle. In grinding the clearance on the drill, the cam action moves the drill toward the grinding wheel in both directions so that clearance is ground both on the small diameter and on the cutting edge. Three and four-lip drills can be ground by changing the gear ratio between the camshaft and spindle.

Gear Lapping Machine

FOR high speed finishing of gears not over 4½ in. in diameter, *Gear Processing, Inc.*, 6700 Grant Avenue, Cleveland, is offering a new automatic, double-spindle lapping machine. A pneumatically indexed table carries three arbors, one of which acts as a



ABOVE

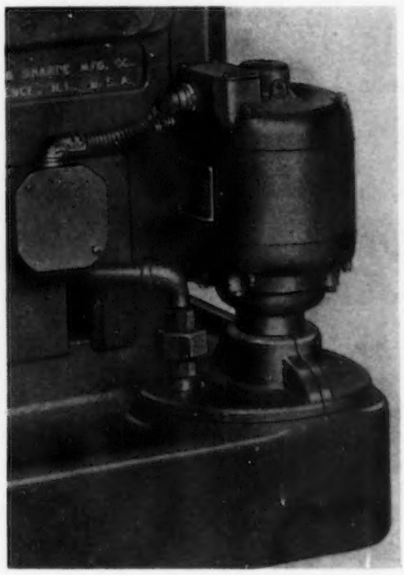
TO remove the pads from the new four-jaw collet chucks just introduced by Gisholt Machine Co., Madison, Wis., and to install another set requires about 2 min., less than one-third the time formerly necessary. The operator needs only loosen a thumb screw, slip off the aluminum guard shown, and take out four Allen set screws that secure the pads. Designed for Nos. 3, 4 and 5 ram type universal turret lathes and 1L, 2L and 3L high production turret lathes, the new chucks have capacity up to 2½ in. diam. for the former and up to 4¼ in. on the latter. The master collet is of the push-out type and is keyed to the collet hood, which in turn is bolted and keyed to the standard spindle nose. Collet pads are available for any shape and size of bar stock within the range.

o o o

AT RIGHT

BROWN & SHARPE'S new No. 205 centrifugal Motorpump is similar to the No. 206 size, except that it has a depth of submergence of only 6¼ in. for use in shallow tanks and where the height is restricted. Pump is fitted with a fully enclosed motor, with rotor mounted on grease sealed ball bearings. Integral pump shaft is stainless steel, and the aluminum bronze impeller is of the open type.

o o o



loading and unloading station during the work cycle. The laps are mounted in the end of bell-shaped holders and are reciprocated 360 times per min. Air cylinders, adjustable for pressure, apply torque of the laps against the gears, first in one direction, then in the other. The time of lapping is governed by an electric program clock and relays.

Abrasive grain suspended in an inert liquid is lifted from the sump by an air hoist to the top of the machine, and then feeds through the reciprocating spindles to the two laps. The height of the laps are adjustable and the stroke can be varied up to 1¼ in. by a graduated dial at the flywheel hub. After the gear is indexed through two laps, it is blown clean of abrasive by a rapidly whirling blast of air in a counterweighted can swung down over the work by the operator when the table indexes to the unloading position.

Turret Lathe With Preselected Speeds

BY incorporating a hydraulic gear shifting mechanism and preselector speed dial in the head, *Bardons & Oliver, Inc.*, Cleveland, is able to effect changes in spindle speed on its Nos. 5 and 7 universal turret lathes through the shifting of a single lever. This enables the operator to concentrate his attention on the work, without having to reset a number of levers at the time of diameter change. The only manual effort necessary is to depress the single clutch control lever slightly at one point in its motions when the gears are idling and the hydraulic shift takes place. The operator turns the selector dial to the second speed while the machine is running at the first speed.

Combined with the selector dial is a cutting speed chart that enables the operator to pick the correct spindle r.p.m. for a given surface cutting speed on the range of diameters within the capacity of the machine. Spindle speeds are etched in large size on a drum turned by four spokes and the number is read through a window above the speed conversion chart. Removable clips on the dial carry numerals indicating the number and sequence of speeds desired for operations.

STANLEY No. 150 contour grinder comes complete with adjustable light fixture and a set of pencil wheels and rotary files.

Contour Grinder

FINISHING of dies, gages, templates and special shapes can be performed on the No. 150 contour grinder with the use of various shaped mounted points, up to ¼-in. shank, in the chuck or by wheels on the arbor. An assortment of mounted points and rotary files comes with the equipment, which has just been announced by the *Stanley Electrical Tool Division*, New Britain, Conn. Spindle is on the extension of a ⅜-hp. universal motor operating at 18,000 r.p.m. It is mounted under a 12 x 12-in. table in a holder that is adjustable from 90 to 45 deg. Motor unit can be readily removed from holder and used with special accessories for tool post lathe grinding.

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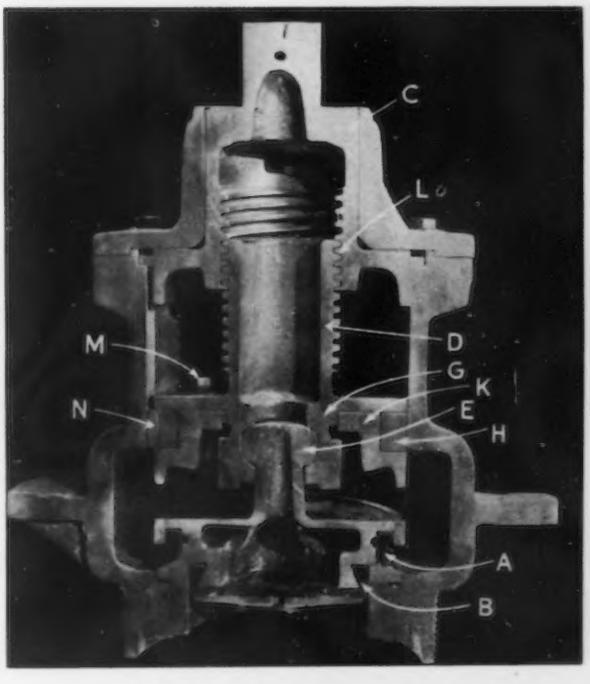
o o o

A NUMBER of innovations have been made in the tank car outlet valves illustrated at right, made by George Valve Co., Saegerstown, Pa. Virgin bronze is used throughout to prevent corrosion by galvanic action and the presence of scale or other foreign matter between valve face and seat is eliminated by the wiping action of two neoprene rings designated as *A* and *B* in the cross sectional view. Neoprene is du Pont's chloroprene rubber. When the valve is open the two rings come together, but in closing the lower one wipes the seat while the other one cleans the shoulder of scale. Another feature of the valve is that once it has been seated, further turning of closing member *C* causes screw *D* to rotate as an integral part of it and "free wheeling" takes the place at the ball *E*. During the initial stages of tightening the valve, screw *D* is restrained from rotating through the friction of the parts and serves to seat the valve.

o o o



Edgar Thomson's New Slabbing Mill

THE Edgar Thomson slabbing mill, put into operation recently at Braddock, Pa., is a portion of Carnegie-Illinois Steel Corp.'s expansion program which included the building of the Irvin Works. Although the new roughing mill, built by United Engineering & Foundry Co., Pittsburgh, was primarily designed to be a slabbing mill, blooms can be rolled by substituting grooved rolls for the cylindrical ones now in use. This new mill, which is classed as the world's largest, has an annual capacity of approximately 1,500,000 gross tons. Because slabs up to 60 in. wide were to be rolled, it was decided by the company to have a universal slabbing mill built with powerful vertical rolls.

Accordingly, the drive for the vertical rolls forms a separate unit which consists of a combination of bevel and single helical spur gears. These form separate and fully enclosed air tight gear units with all the shafts mounted in roller bearings. The mounting of the driving bevels on hollow steel shafts assures positive mounting and reduces the driving shaft to essentially a spindle, subject to torsional stresses only. Special features on the mill insure a complete and convenient way of changing rolls.

The slabber will handle ingots in sizes up to 32 x 66 x 90 in. and weighing up to 45,000 lb. The roll dimensions are 45 x 80 in., each driven by a 5000-hp. motor. The vertical rolls measure 36 in. in diameter and are both driven by a 3000-hp. reversing motor.

Part of the total equipment includes a United patented "down and up cut" shear with a maximum knife pressure of 1200 tons, and is driven by two 350-hp. mill type motors.

The measuring device or gage on the mill has some novel features, among which are an adjustable stop of extra heavy design, a screw which has a 12-in. diameter, and two side rails which take the impact of the oncoming steel and transmit the load to heavy cast steel stands. By removing two wedges, the whole gage may be removed for access to the machinery below.

Another interesting feature of the mill is the shear delivery table which is a shuttle type, thus leaving a gap adjacent to the shear to let the crops fall through. By shifting the shuttle table, this gap may be close to permit short pieces to pass over the shear delivery table and for this purpose the rollers are spaced closely and are driven by two line shafts with separate motor drives.

To assure ample strength and to avoid the large additional cost involved in handling short slabs, it was decided to design all tables and piling equipment back of the shuttle table for a minimum slab length of 5 ft. The maximum slab length normally is 20 ft. but pieces up to 30 ft. may be handled, if required.

The shuttle table back of the shear fulfills three purposes: first, to create a gap back of the shear for the disposal of crops; second, a gap may be formed back of the shuttle table to shoot short blooms into a bucket or a bloom conveyor, should it become desirable at a future date to produce short blooms on the mill; third, the shuttle table may be kept in an intermediate position so that the gaps on either side of it will be about equal and slabs as short as five ft. can pass over them.

From the shuttle table, the slabs go on to a table with a built-in test scale. This scale is equipped for automatic recording equipment similar to the ingot scale.

A motor-operated pusher shoves the slabs onto a transfer, on which they travel to piler tables in the slab storage. The transfer was designed in such a way to avoid warping and other distortions likely to result from the hot slabs.

Four slab pilers are provided, two to each storage building. They are of the screw operated elevator type for forming the pile. Motor operated rack type pushers push the slabs on the platen of these elevators, one slab on top of another, until the desired load is accumulated. Then by means of another pusher the load is moved onto stationary skids from which they are removed by chain slings and crane.

The engineering of this large mill was new from start to finish and the most advanced practice was followed. Wherever feasible or practical, anti-friction bearings were used and all gears operate in oil tight cases. Central oil and grease systems perform the lubrication automatically. All auxiliary units are motor operated.

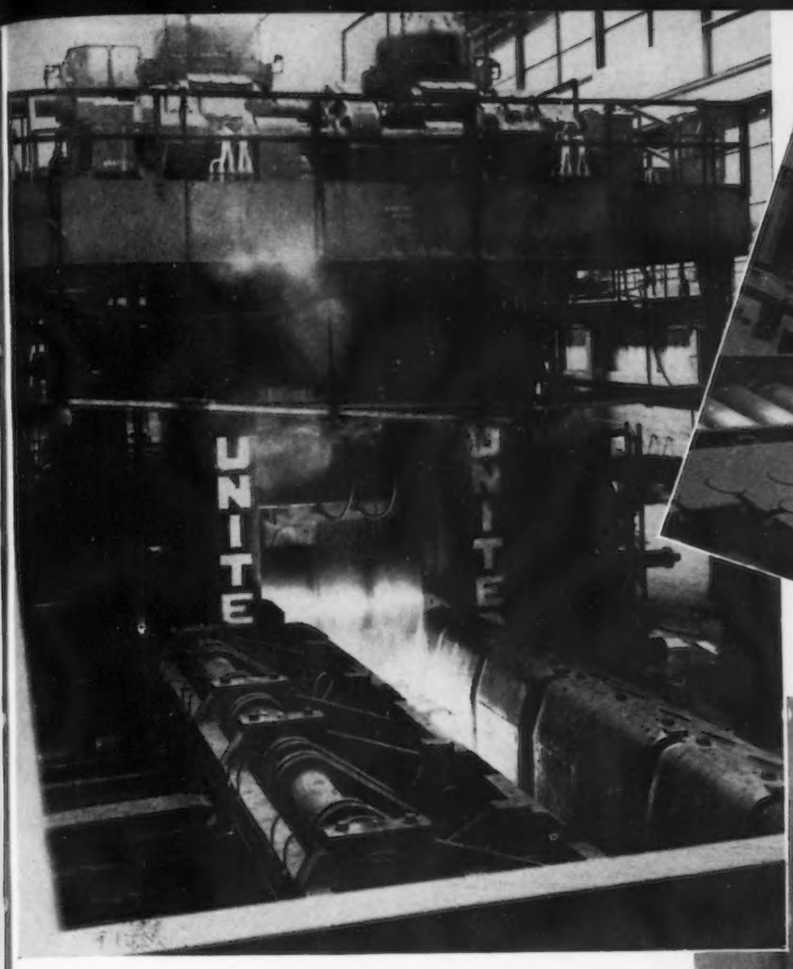
FIG. 1
The mill's first ingot being slabbed.

FIG. 2
Buggy depositing ingot on the receiving table. Soaking pits in background.

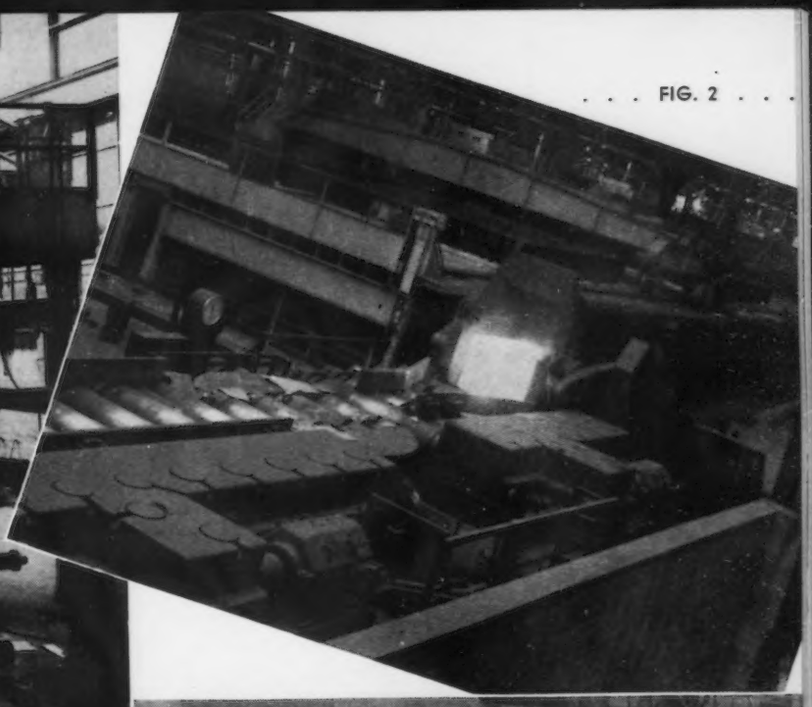
FIG. 3
The mill as seen from the soaking pits.

FIG. 4
The shear. Note its simple and sturdy design.

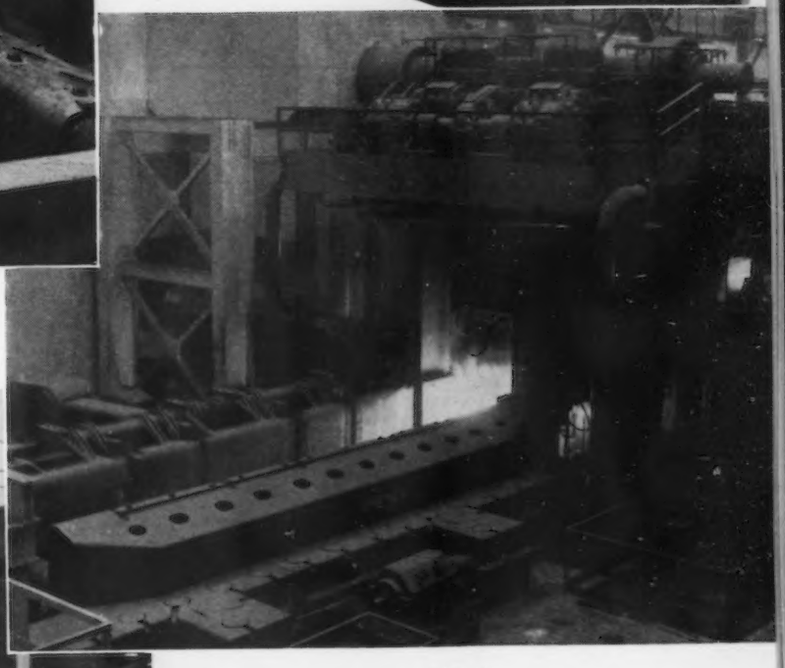
FIG. 5
The slab piling equipment.



. . . FIG. 1 . . .



. . . FIG. 2 . . .



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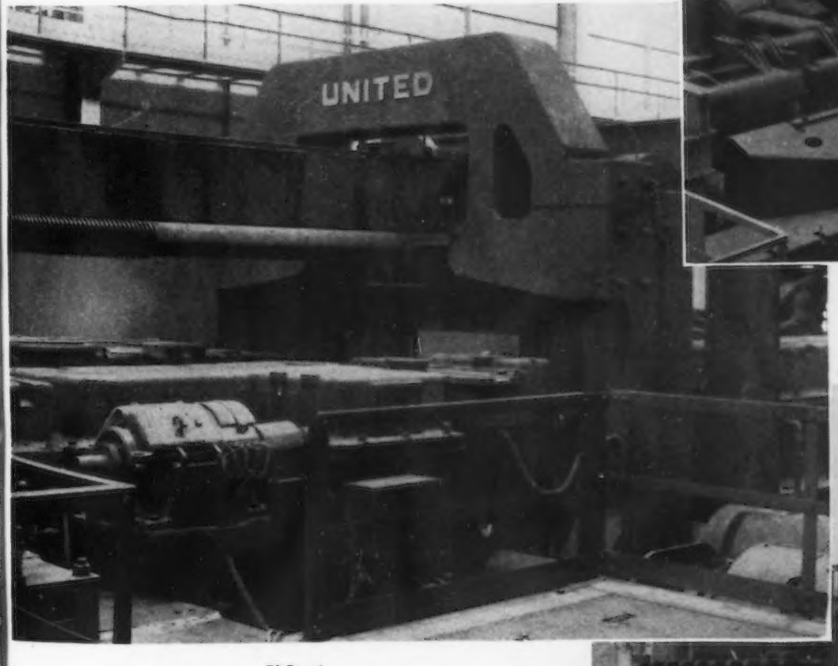
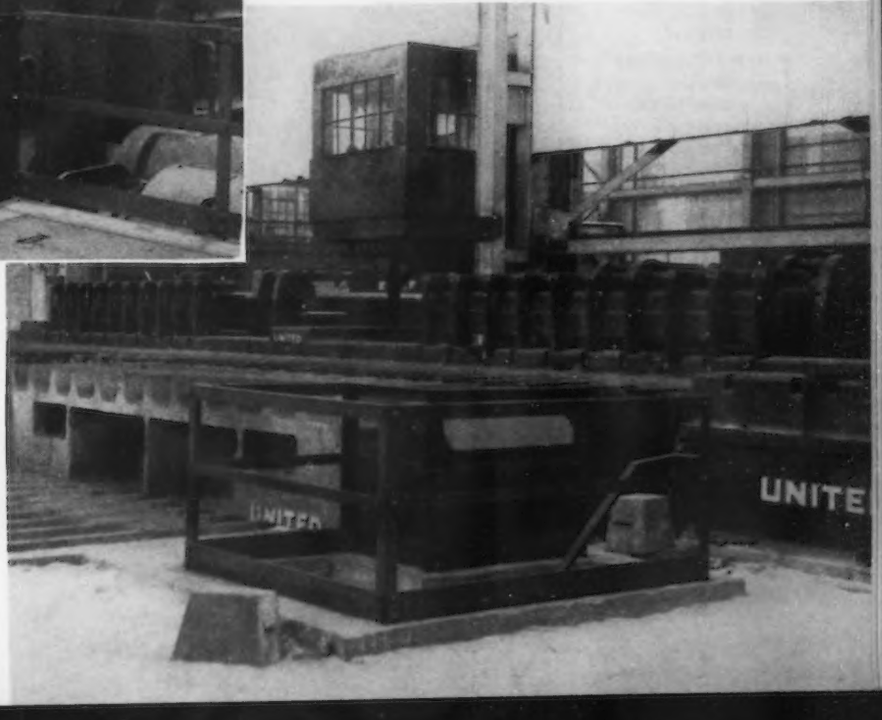


. . . FIG. 4 . . .



RIGHT

. . . FIG. 5 . . .

Grand Coulee Penstock Units Flame Shaped

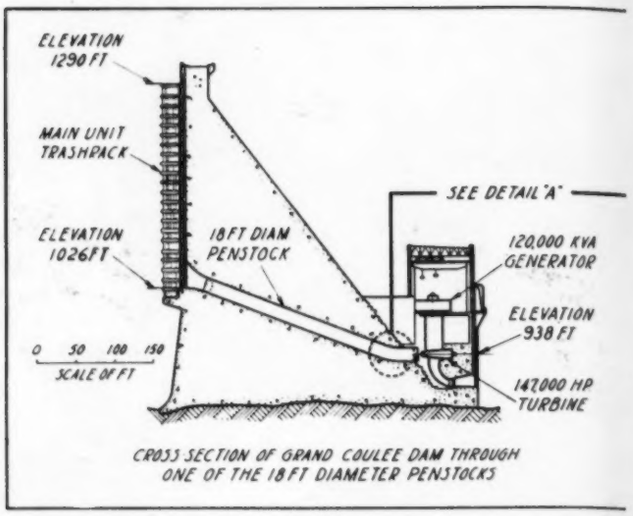

ELEVATION 1290 FT
MAIN UNIT TRASHRACK
SEE DETAIL "A"
ELEVATION 1026 FT
18 FT DIAM PENSTOCK
120,000 KVA GENERATOR
ELEVATION 938 FT
0 50 100 150
SCALE OF FT
147,000 HP TURBINE
CROSS SECTION OF GRAND COULEE DAM THROUGH ONE OF THE 18 FT DIAMETER PENSTOCKS

FIG. 1—Arrangement of one of the 18-ft. diameter Grand Coulee
left. The next sketch gives details of the reducing bend of the
ous segments of which are flame shaped previous to welding. The
shown in the lower of the two sketches at the right. (This and the
The Linde Air

IN the construction of the Grand Coulee Dam the number of applications of the oxy-acetylene blowpipe and of the electric arc have been legion. One of the interesting current uses is in connection with the construction of the 18-ft. diameter penstocks.

The base of the dam, including foundations for the two power houses has been completed, and fabrication of the penstocks is under way. Eighteen main turbines, nine in each power house, are planned. Rated at 150,000 hp. under a head of 330 ft., each turbine will be fed by an 18-ft. diameter penstock passing through the dam, as shown in the accompanying line sketch, Fig. 1. When developed to the extent proposed, the power plant will be larger in capacity than any other in the world.

An interesting application of flame cutting is in beveling, for subsequent welding, all circumferential edges of segments for the reducing bends at the down-stream ends of the penstocks. The plates for these segments are fabricated in half sections, or in plate terminology "2-plates around," then rolled into half rounds and finally assembled by welding. Cutting of the bevels is preceded by squaring the edge of the plates, also done by the gas torch.

The set-up for flame cutting one of the segments at the face of the dam is shown in Figs. 2 and 3, while the position of this segment as well as the design of the cut edge and the sequence of operations are indicated in the center and right-hand sketches of Fig. 1. As this particular plate is 2½ in. thick, whereas the balance of the bend segments are 1½ in. thick, an additional cutting operation was necessary to reduce the plate thickness 1 in.

The templet for guiding the cutting machine to the correct curvature consists of a Masonite track and wooden framework. Cutting speeds for the four operations are as follows: (1) Squaring the edge, 6 in. per min.; (2) top-welding bevel, 9 in. per min.; (3) bottom welding bevel, 9 in. per min.;

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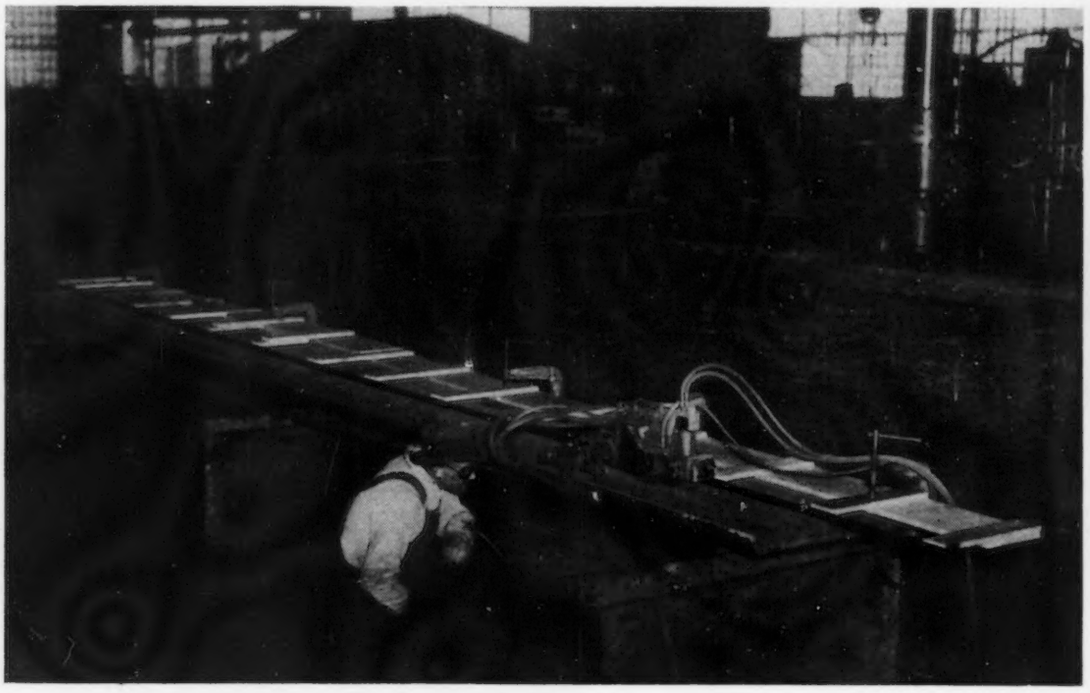
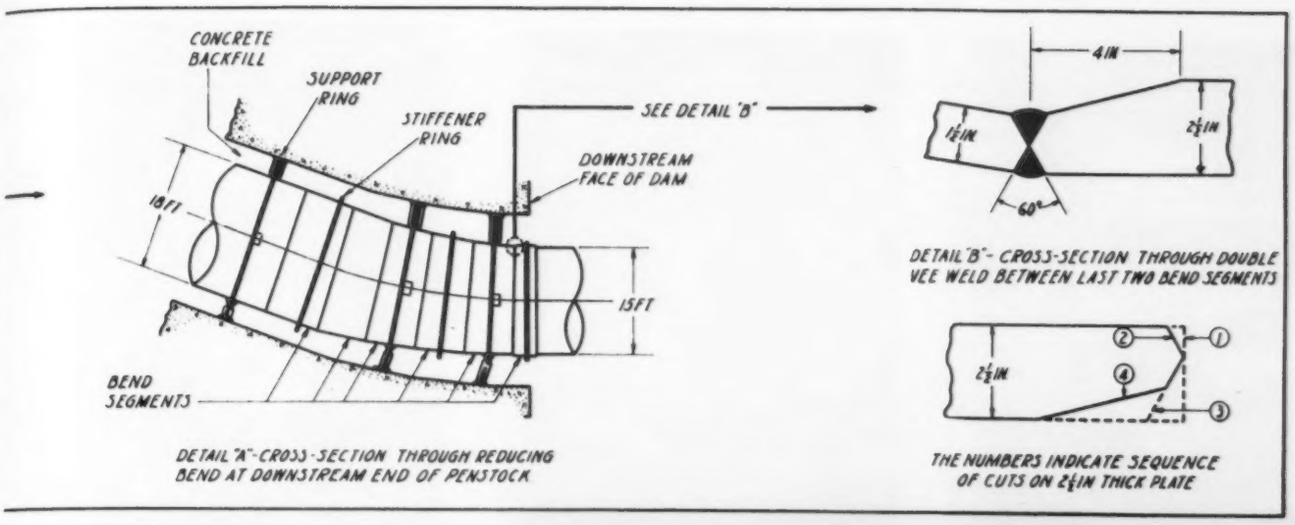


FIG. 2—Flame shaping the penstock reducing-bend plates at the shops of the Chicago Bridge & Iron Co. The templet for guiding the cutting machine to the correct curvature consists of a Masonite track attached to a wooden framework.

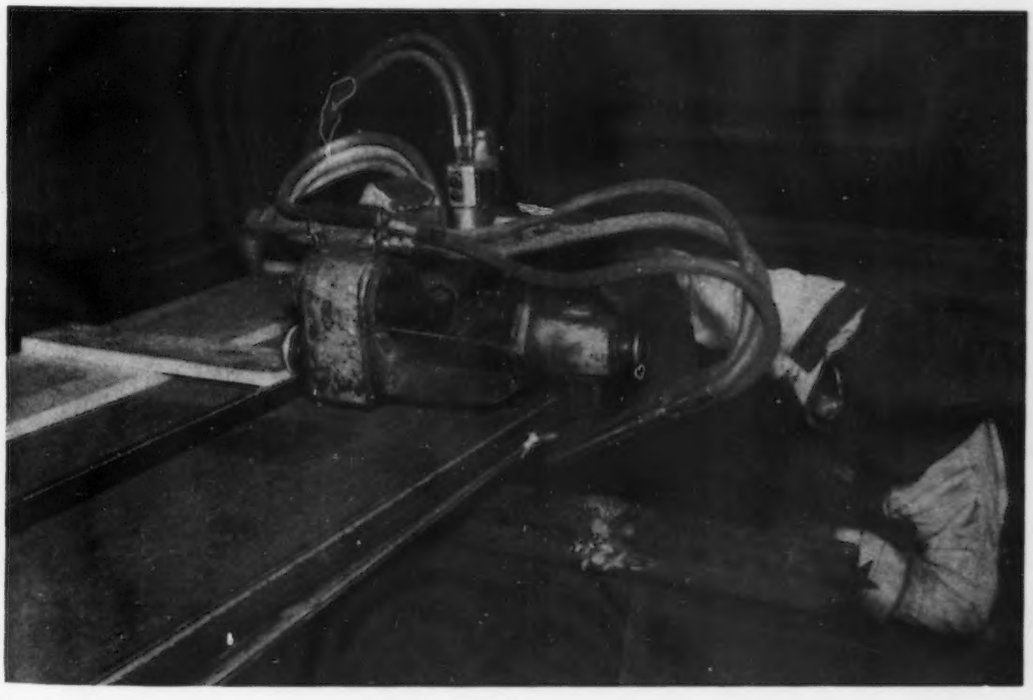
o o o



Dam penstocks is shown in the sketch at the penstock, the circumferential edges of the vari-sequence of operations on the plate edges are other illustrations herewith are by courtesy of Products Co.)

and (4) thickness-reducing bevel, 5 in. per min. The same portable cutting machine was used for the first three operations, while for the fourth cut a similar machine with a special outrigger was employed.

In addition to the beveling cuts on the bend segments, flame cutting is employed to cut to shape all of the stiffener rings and support rings, which will number 500 or more. Each of these rings consists of six welded segments; four of these are shown in the foreground of the illustration of the completed bend segments, Fig. 4.



ABOVE

FIG. 4 — Completed bend segments and, in the foreground, four of the six segments that form the stiffener rings. There will be some 500 of these stiffener and support rings, and all of them will be flame shaped previous to welding.

o o o

AT LEFT

FIG. 3—Close-up of the flame cutting machine showing the last beveling operation (No. 4 in sketch) to reduce the plate thickness from 2½ in. to 1½ in. Note the use of the special outrigger which permits beveling the plate from the underside.

F. H. STOHR

C. P. ROGERS

J. F. ROGERS

. . . PERS

FRANK H. STOHR has been appointed manager of all industry sales departments, Westinghouse Electric & Mfg. Co., East Pittsburgh. He was promoted from the management of the recently consolidated transportation and generator divisions of the company. R. A. NEAL has been appointed assistant to vice-president; C. F. LLOYD has been appointed manager of the central station sales department, and W. A. FURST has been appointed coordinator of navy and maritime activities.

L. B. MCCULLY, who has been identified with the Westinghouse company since 1916, has been made manager of the transportation and generator division, succeeding Mr. Stohr. He joined the company as an engineering student in the apprentice course and was later made a production clerk in a machining department. By 1927 he was assistant superintendent of production of the East Pittsburgh works and two years later was appointed head of production. In 1935 he was made assistant superintendent of the generator division and the following year superintendent of that division.

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CHARLES P. ROGERS, who has been president since 1929 of Beals, McCarthy & Rogers, Inc., Buffalo, has become chairman of the board to "lighten his duties." Mr. Rogers, who is 73 years old, started with the 113-year old company in 1880 as an errand boy. J. FREDERICK ROGERS, his son, who started with the company in 1924, has been elected president. Recently he has been vice-president. GEORGE F. EVANS, formerly general manager, has been made vice-president and treasurer, the general managership having been abolished. Mr. Evans has been with the company for 34 years. EUGENE F. MCCARTHY, who has been secretary and treasurer, has been made vice-president and secretary.

❖ ❖ ❖

R. E. GREENWOOD has been appointed district sales manager of the Chicago territory of the American Chain Division, American Chain & Cable Co., Inc., with headquarters at 400 West Madison Street, Chicago. He succeeds G. B. KUTZ, who has been transferred to York, Pa., as assistant to the general manager of sales of the chain division. R. C. BRENIZER has been appointed Philadelphia district sales manager of that division, with headquarters at Second and Diamond Streets, succeeding Mr. Greenwood.

❖ ❖ ❖

L. R. KELLS, who has been associated with the industrial furnace industry for over 20 years, has been appointed chief engineer for Salem Engineering Co., Salem, Ohio. He was graduated from Ohio State University in 1914.

❖ ❖ ❖

V. A. SHEALS, for more than 15 years a member of the cable section of the General Electric Co.'s central station department, has been named assistant designing engineer of the cable engineering department. He has been wire and cable specialist for the New York district since 1930.

❖ ❖ ❖

L. A. DELANEY has been appointed mill superintendent, William B. Scaife & Sons Co., Oakmont, Pa., succeeding CHARLES E. NEUDORFER, who has been appointed to the newly-created position of chief engineer of the mill. During the past five years Mr. Delaney has been superintendent and material supervisor of the Baldwin-Southwark Corp., a subsidiary of the Baldwin Locomotive Works.

EUGENE S. SEDLACHEK, formerly manager of the water purification departments, has been appointed general sales manager of ranges, boilers, special tanks, cylinders, domestic water softeners and domestic filters. FLOYD E. THELAN succeeds JOHN M. GREEN, who returns to the home office after serving six years as manager of the Chicago branch.

❖ ❖ ❖

R. S. SCHMIEDER, associated with the Milcor Steel Co., Milwaukee, since 1913, has been appointed manager of the new branch being established by the firm in Baltimore, on March 1. He devoted six years to traveling for the concern and in 1919 was appointed

R. E. GREENWOOD

R. C. BRENIZER

L. R. KELLS

ONALS . .

manager of the metal ceiling department. In 1935 he was named assistant manager of the metal lath and specialties division.

HARRY C. BOARDMAN, research engineer of Chicago, was guest speaker at the monthly meeting of the Milwaukee section, American Welding Society. He discussed the development of stress welding with shielded electrodes and gave an explanation of the various types of steel structures to which welding is now applied.

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ERLING WINSNES, since 1930 manager of the district office of the Allis-Chalmers Mfg. Co., Milwaukee, at Santiago, Chile, has been advanced to the managership of the firm throughout South America, with headquarters at Buenos Aires, Argentina.

❖ ❖ ❖

WILLIAM D. THOMAS has resigned as president and general manager of Sandvik Steel, Inc., American representative of the Sandvik Steel Works, Sandviken, Sweden, to become distributer of cold rolled razor blade steel for the Stanley Works, steel division, Bridgeport, Conn. He will make his headquarters in the Chrysler Building, New York, on his return from Sweden, March 1.

R. K. GLASS, metallurgical department of the Republic Steel Corp., was the guest of the New England Foundrymen's Association at its February meeting. Mr. Glass gave an illustrated address on defective castings, their causes and remedies.

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REX E. DELONG, formerly Northwest sales manager of E. F. Houghton & Co., Philadelphia, has been placed in charge of the newly-created processing materials division of the Pacific Machinery & Tool Steel Co., Portland, Ore. The latter company has been appointed distributer in the Northwest of the heat treating and finishing products of the G. S. Rogers & Co., Chicago.

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JOHN S. DEAN, widely known transportation maintenance engineer, has retired from Westinghouse Electric & Mfg. Co., East Pittsburgh, after 36 years of service. Mr. Dean has written and published several books, among them "The ABC of the Electric Car," and "Therapeutics of Railway Equipment." He was graduated from the Drexel Institute of Technology in 1897 and began work for Westinghouse in 1902. After completing the two year electric apprentice course, he was assigned as maintenance engineer to the railway engineering division. Mr. Dean joined the teaching staff of the Westinghouse Technical Night School in 1909 and continued in that work until 1926.

ROSCOE SEYBOLD has been elected a director of Westinghouse Electric & Mfg. Co., East Pittsburgh. He has been associated with this company since his graduation from Purdue University as an electrical engineer in 1907 and has been vice-president and comptroller since 1934.

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J. F. MCINTIRE, of Detroit, vice-president of the United States Radiator Corp., has been elected president of the American Society of Heating and Ventilating Engineers.

❖ ❖ ❖

W. J. SENGER, who has been identified in various capacities with the Van Dorn Iron Works Co., Cleveland, for 11 years, has been appointed manager of sales.

❖ ❖ ❖

ROBERT R. MCMATH, has been elected chairman of the board of Motors Metal Mfg. Co. The change was one of several in the official lineup announced after the annual meeting in January. STEVEN J. MENZEL, formerly vice-president, was elected to the presidency to succeed Mr. McMath. NELSON C. JOHNSON, formerly secretary and treasurer, was made vice-president and secretary. HAROLD G. SHAW was named treasurer. The directorate consists of the foregoing officers, excepting Shaw, and NEIL C. MCMATH, WILLARD S. POPE, HARRY A. BURNETT and CHARLES T. MILLER.

(CONTINUED ON PAGE 63)

THIS WEEK ON THE ASSEMBLY LINE

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By W. F. SHERMAN
Detroit Editor

o o o

. . . Weather cuts auto production, but rebound is indicated . . . Million car output seen for first quarter . . . Lack of mechanical changes to be felt in decreased machine tool programs . . . Ford opens press shop and tool and die shop to visitors.

DETROIT—The blizzard which swept the country last week resulted in a reduction of automobile assemblies to 79,410 units from the 89,200 total of the previous week. This compared with 51,443 assembled units in the corresponding week of a year ago, according to Ward's Automotive Reports. Meanwhile, estimates of automobile production for the first quarter were advanced by Ward's which stated that output of a million vehicles in the first quarter now is assured.

Continued output at better-than-seasonal rate accounted for the production of 368,000 cars and trucks in January, which is thousands of units higher than had been expected. Upward of 300,000 cars will be assembled during the current month, it is conservatively estimated. The current week should show a substantial recovery from last week's level.

During January manufacturers found it necessary to boost their schedules steadily.

Even with highways blocked by snow during the past week and parts suppliers unable to make deliveries in many cases because of the weather, Ford, Lincoln-Zephyr and Chevrolet maintained outputs at the level which has now been followed consistently for four successive weeks, turning out 21,000, 750, and 20,500 units, respectively. Plymouth's volume dropped from 10,580 to 6350. Weather difficulties accounted for the closing of Ford's Chicago plant the first two days of the week, Plymouth and Dodge one day each, and caused delays at Chevrolet's Buffalo branch.

Registration Up in December

Complete figures for December show that the registration trend continued upward. Purchase of 226,973 new passenger cars in December as compared with 200,853 in November is reported by R. L. Polk & Co. This is an increase of 13 per cent, while the December, 1938, figure exceeds the December, 1937, total of 179,621 by 26.36 per cent. Summarizing registrations for the year, it appears that 1938 fell 45.71 per cent below registrations in 1937.

Truck registrations last year, while not off quite so sharply as passenger cars, were 40.90 per cent below 1937 volume, the comparison being, 1938—365,489; 1937—618,249.

Few Mechanical Changes for 1940

A realistic view of the industry's plans for 1940 models forces the conclusion that mechanical change will be at a minimum, although developments within the next few weeks may cause a revision of this opinion. However, tracing the course followed by the industry since fall announcements of new cars became the practice reveals that parts blueprints usually are released for study in November, December or January, preliminary to peak activity in machine tool offices, starting in February. So far this year, the machinery people have watched in vain for any indication that there would be major programs and have finally reached the conclusion that there is little chance of this sort to look forward to.

It is known that some manufacturers have 1940 plans definitely set. For one car, at least, approval was given last week to the entire body job from the dash to the rear bumper. Final OK on the front end units is pending. This car, one of the major successes of the 1939 model season, will incorporate few mechanical changes.

Design trends have made the front fender so prominent, and so big, that one stamping company foresees the disappearance of the radiator grille stamping. On one new design the front fenders provide so much coverage that they almost meet at the center of the car.

Ford Program Completed

Completion of two major units in the $34,000,000 expansion program carried out last year by Ford Motor Co. was signalized last week when visitors were led through the press shop and the consolidated tool and die shop which are in operation at the Rouge. The new press building, which covers 64 acres, is an "L" shaped building three quarters of a mile long and 1000 ft. wide. It joins the old pressed steel building, the spring and upset building and the rolling mill, which in turn, is connected with the open hearths. The buildings bridge the main roadway through the plant.

In this unit Ford exemplifies the

P&W ELECTROLIMIT GAGES

Maintain smooth, accurate, selective assembly

This Electrolimit 4" External Comparator checks and sorts automotive wrist pins at better than 700 per hour.

THESE modern instruments for governing production accuracy have won their automotive spurs. In various forms Pratt & Whitney Electrolimit Gages have reduced costly automotive inspection to a simple, economical routine. These gages can sort parts with uncanny speed into accurately matched groups. This means tremendously reduced assembly time.

Pratt & Whitney Electrolimit Gages will smooth out your gaging difficulties. They pay for themselves in short order by reducing costs—and then go right on producing dividends. There are many types of electrolimit gages—all basicly the same—but each designed for a particular inspection job. A car produced under electrolimit inspection and selective assembly goes together with precision, and delivers top-notch performance.

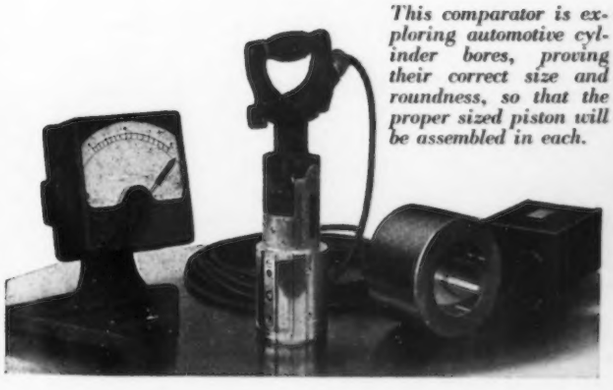
Let us give you complete facts and figures.

This Electrolimit Internal Comparator will check the holes in automotive connecting rods, and many other similar spots where precise grading and sorting are needed.

Would you like to have complete information on Pratt & Whitney Electrolimit Gages and what they do? Write today to

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND CO.
HARTFORD • CONNECTICUT

"Better Precision at Lower Cost"



This comparator is exploring automotive cylinder bores, proving their correct size and roundness, so that the proper sized piston will be assembled in each.

"straight-line" production methods for which his organization is famed. One could dramatically trace the production processes from ore to finished steel and completely welded bodies. The arrangement of the presses is unique in that most of them are located on the second floor, while the ground level "basement" contains cast steel supports for the presses, an electric substation and a few presses for small parts. Conveyors are a conspicuous feature of the building and the shipping conveyor alone is approximately four miles long.

The plant layout is a marvel. The fender presses, virtually the heaviest in use, are located at an "L" near the steel storage, which is fed by the rolling mill. Smaller presses and welders for succeeding operations are arranged nearby. The material passes through a blanking press, an oiler, into stacks for feeding into the draw dies. Conveyors carry stampings through cleaning chambers and also carry away the completed fenders. Situated nearby is the grille stamping department. Body and side panels and steel tops are made on still another press along the side of the "L" and at the end of the main section. Fitted into the floor plan is lighter equipment to make small parts from scrap which receives a minimum of handling.

Construction of the press shop has increased the plant's capacity by 2000 bodies a day. There are 2100 presses in the building, about 300 of them being new.

Easy relocation of equipment is possible with three 90-ton overhead cranes to do the heavy work of moving the bigger pieces of equipment. The floor is made of 1-in. steel plates, surfaced with cedar blocks. The plates are screwed to floor beams and can be easily removed to provide an opening for relocating presses. Crane equipment also includes four 60-ton, seven 20-ton and two 5-ton cranes.

The new air-conditioned tool and die shop represents a consolidation of all this type of Ford work. Tool rooms, scattered through the plant, will do only maintenance work. The plant is 1225 ft. long by 300 ft. wide, contains 1311 machines, of which 508 are new. At present about 1900 men are employed.

Three divisions in the plant carry the brunt of Ford tool and die work. They are the body die and small die construction division; tool, jig, fixture and gage division, and machine construction and repair division. The plant is equipped with two 50-ton cranes, two 20-ton cranes in the main bay and eight 10-ton cranes in adjacent bays. Two 20-ton, three 10-ton transfer cranes and 69 electrical hoists are to be installed. No hand hoists will be used.

Both buildings are architecturally pleasing to the eye and bear little resemblance to older factory designs. In the tool and die shop all overhead steel work, air-conditioning ducts, roofs and side walls are painted white and the equipment itself is painted a dark blue, said to be restful to the eyes.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

DAVEY, I HEAR THEY'RE PUTTIN' YOU ON TH' SHOP COMMITTEE TO GO UP AN' HIT TH' OLD MAN FER A GENERAL RAISE
WHY, I --UH-- ME? ME-E-E-E! A RAISE FOR TH' WHOLE SHOP, YOU MEAN?
POOR DAVEY! THEY LIKE TO RUB IT IN ABOUT TH' TWO SHARES OF STOCK HE'S GOT IN THIS COMPANY.... HE HATES TO GET A RAISE HIMSELF EVEN!
YEH, I KNOW-- HE THINKS HE'LL LOSE ON HIS STOCK IF HE GETS A RAISE-- AND HELPIN' TO GET A GENERAL RAISE WOULD KILL HIM!
COPR. 1939 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
THE FINANCIER
J.R.WILLIAMS 2-3

Engineer May Yet Be Voters' Demon, Herbert Hoover Says

A POSSIBILITY that the engineer may yet become a national demon set-up by politicians to gain the votes of the unthinking is foreseen by former President Herbert Hoover.

We engineers sometimes had bright economic thoughts which statesmen were slow to get and years ago engineers announced that the way to lift the standard of living was to eliminate waste and reduce the costs of production, Mr. Hoover declared at the recent 36th annual dinner, in New York, of the Alumni Association of the Stevens Institute of Technology.

"We said thereby prices would come down and the people could buy more and employ more people on the job. We said that thereby hours could be shortened and wages increased. A few years later the economists also announced the discovery of this idea.

"But even with these reinforcements," continued Mr. Hoover, "it is apparent that the lawmakers have not heard of it. At least, they are busy increasing waste and putting costs up by a variety of devices. Thereby prices go up. And people buy less, and that throws other people and even themselves out of jobs. Public orators then blame it on "technological" unemployment, with an accusing finger pointed at the engineer."

Building Activity Continues to Expand

BUILDING activity throughout the country continues to show promise of one of the most active first quarters experienced in several years, according to reports issued by the F. W. Dodge Corp. and *Engineering News-Record*.

In January, the engineering journal reports, heavy construction awards totaled $311,693,000, the highest for any January since 1929. On an average weekly basis, the January figure represents the highest level reached since May, 1930.

In the residential field, the Dodge agency reveals that contracts placed in the first three weeks of January amounted to $50,095,000, a gain of 112 per cent over the comparable period of 1937.

Both these reports indicate, however, that private work is improving at a very slow pace, and public projects continue to account for the bulk of current activity. In the past month public works accounted for 58 per cent of all heavy construction contracts.

Revere Brass President Writes Economics Book

THE only formula for providing work and prosperity is to produce with the aid of science the largest possible amount of goods, with the least possible amount of human labor, marking each lowering of cost of production by an increase in wages and decrease in selling price, thereby expanding the market for and the use of the product. That is the opinion of C. Donald Dallas, president of the Revere Brass & Copper Co., whose new book "You and Your Money" has just been released by Prentice-Hall, Inc., 70 Fifth Avenue, New York.

Westinghouse to Build Units for New Streamliners

ELECTRICAL equipment for six diesel-electric 750-hp. streamlined trains, to be placed in service this summer by the Southern Railway, has been ordered from the Westinghouse Electric & Mfg. Co. The contract amounts to more than $100,000. Each of the six motive power units will include an electric generator and two 450-hp. driving motors. Diesel engines for the trains are being built by the Fairbanks-Morse Co. The train is being built by the St. Louis Car Co.

THE instant a part being inspected is placed between the anvil and gaging element of the Sheffield Visual Gage its accurate measurement is flashed on the dial at the speed of light. This is possible only because of the mechanically positive Reed Mechanism for primary magnification and the utilization of a light beam for secondary magnification. Incidentally, this is a combination that is found exclusively in Sheffield Gages. The Sheffield Visual Gage is thus the most rapid inspection device available.

In addition, there is nothing in the magnification mechanism to wear out except an ordinary electric light bulb, replaceable for a few cents. Consequently, the Visual Gage is the most economical as well as the most rapid, accurate gage available.

Standardize on Sheffield Visual Gages, recognized by gaging authorities everywhere.

SHEFFIELD
GAGE CORPORATION • DAYTON, OHIO, U.S.A.
MASTER GAGEMAKERS
NITRIGAGES

THIS WEEK IN WASHINGTON

. . . State Department still strongly opposes legislation limiting exports of scrap, pig iron . . . Many armament bills launched in Congress . . . Business council "cooperative," Harry Hopkins finds . . . Commerce Department may use subpoena to obtain trade association data.

WASHINGTON — The enormous surplus of 11,000,000 bales of cotton has piled up and the market is narrowing. Deeply concerned, Secretary of Agriculture Henry Wallace is said to be considering a policy of subsidizing exports. Obviously such a policy would run counter to the reciprocal tariff program of Secretary of State Hull. Hence there is in prospect a clash between these two Cabinet members. In such an event it may be expected that the issue would be thrown into the lap of the President for settlement. Whether he could settle it is a question since both Mr. Wallace and Mr. Hull are men of strong convictions.

The situation is interesting when contrasted with the sentiment in Congress with regard to exports of pig iron and scrap. It has become almost a daily occurrence for some member of Congress to introduce a bill either for the licensing or embargoing of these two commodities. At the previous session of Congress most of the bills named scrap only, though pig iron was included in several instances. Scrap dealers protested against the legislation. But, if there were to be such legislation, they urged that pig iron should be added inasmuch as pig iron and scrap are used for the same purpose — for conversion into new steel. There was also some request that steel be embraced in the list for proposed licensing. The upshot is that in the crop of new and revised bills for licensing or restricted embargoing pig iron is thrown in with scrap.

Easily Dramatized

In these days of wars and rumors of war it is easy to appeal to the uninformed mind and inflame it against exports of these products. They lend themselves to dramatization as war materials that destroy human beings, cause widespread suffering and ruin property. A large segment of the daily press and popular magazines play up the story and undoubtedly incite "reader interest" and condemnation of exporters of these materials. Far from a contemplated subsidy, as is being considered for cotton, the movement is to either definitely limit exports of pig iron and scrap or to ban them altogether.

There is no doubt that some members of Congress who have offered such proposals are sincere. As to others, possibly the motive is wholly political.

But, considering those who are in good faith proposing such legislation, why do they not include other products which decidedly are more directly war material than are pig iron and scrap? Cotton, for instance. It goes right into the firing line. Compounded with nitric and sulphuric acids, cotton makes a high explosive which is necessary to fire shell and shrapnel. One cannot suspect that cotton, wheat, oats, and foodstuffs generally, each necessary to warfare, are even remotely considered for licensing or embargoing. There would be a dreadful political fear of the roar that would come, and with good reason, from farmers of the country. Yet they have no better case than does the exporter of pig iron or scrap. And that the latter have a case with strong Administration support is clear from the unchanged attitude of the State Department which has consistently opposed such legislation.

Legislation Doubtful

So despite the increasing agitation for the legislation, given strength by growing war-like gestures of strutting dictators abroad, it is doubted that the legislation will be enacted. Not only would it fly in the face of the reciprocal tariff program but it would carry danger if the United States, at war with no nation, should discriminate as between countries in exporting materials. The bill of Representative Hamilton Fish, Republican of New York, to stop shipments of pig iron, scrap iron and scrap steel to both China and Japan seeks, he says, to apply its provisions equally against all belligerents. But if this principle is projected generally it would only shut off the right of the United States to ship certain products to belligerent countries, only to have them supplied by some other nation, but small nations, having no war supplies, would be at the easy mercy of any other country which does have such supplies. Mr. Fish shares the overwhelming sentiment of the country in opposing the ruthless Japanese aggression of China but his bill will not help the situation.

Scrap Position Explained

The position of the scrap industry and the actual, rather than fancied, significance of the product itself has been well stated by Edwin C. Barringer, executive secretary, Institute of Scrap Iron and Steel.

Replying to an editorial in *The Evening Star* of Washington, which favored scrap licensing legislation, Mr. Barringer pointed out that scrap is not a material of war. He explained that it is converted into various (peace-time) finished products, is exported in relatively small quantities when compared with domestic consumption, and that there is an abundant supply for mills of the United States.

Concluding, he added:

"Scrap has had a bad press because it has been a misunderstood material. Actually, the scrap industry, like the other waste trades, performs a useful conservation service and it provides employment for over 200,000 persons. Scrap dealers contend they are no more suppliers of war material than the farmers who raise foodstuffs for feeding the soldiers."

Those who are urging an embargo

1/8" TO 3/4" DIAMETERS 12" TO 150" LONG . . .

. . . PRECISON GROUND ON ONE CINCINNATI CENTERLESS, WITH ONE FIXTURE

Keeping down the cost of producing special alloy rods, tubes, and bars is a lot easier with the right equipment. Quick deliveries of relatively small batches give the problem a difficult twist. One of the elements in the cost of production, and a mighty important one, is that of finishing and sizing. With the machine illustrated—a CINCINNATI No. 3 Centerless—steel rods and bars ranging in diameter from 1/8" to 3/4" and lengths from 12" to 150" are economically ground. The close accuracy and high quality of finish that may be obtained will satisfy the most exacting requirements. Details of this interesting job will be mailed on request. Catalog G-370 for the No. 3 Centerless will also be mailed on request.

Both Centerless and Center Type Grinders

CINCINNATI

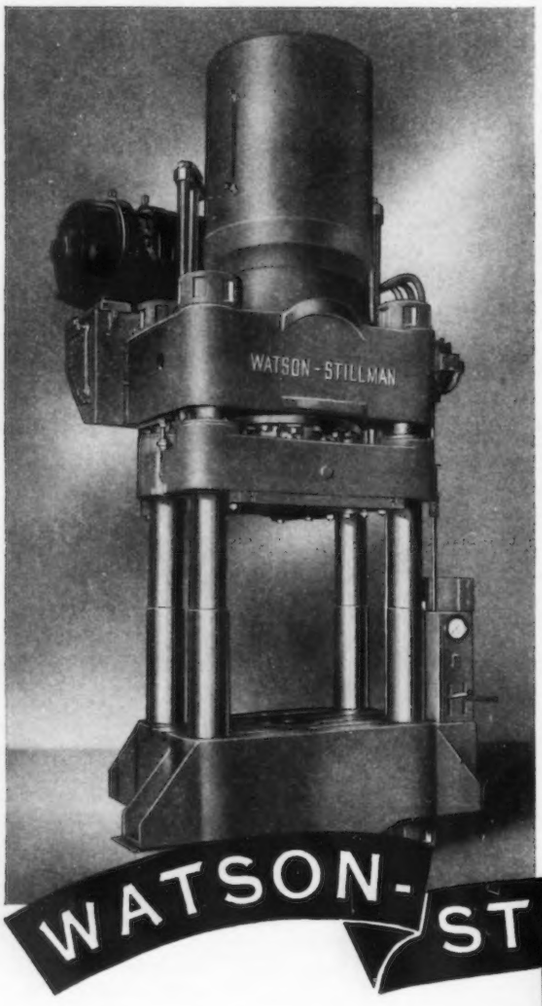
A SYMBOL OF A DEFINITE STANDARD OF WORTH

CINCINNATI GRINDERS INCORPORATED

CINCINNATI, OHIO, U. S. A.

on shipments of scrap to Japan again have been reminded by Secretary of State Hull that scrap is not a munition of war under the Neutrality Act, that if an embargo were proclaimed it would ban exports to China as well as to Japan and that China's purchases of armament from the United States have exceeded those made by Japan.

The position of the State Department was restated in a letter made public last Saturday in which Secretary Hull responded to a letter from Senator Capper, Republican of Kansas, who had forwarded to the department protests from Kansas constituents against shipments of scrap to Japan. Mr. Hull told the Senator that since July 1, 1937, the State Department has issued licenses for exports of arms, ammunition, and implements of war to China in the value of $14,358,277.30 and to Japan in the value of $10,922,693.08.



METAL FORMING PRESSES

This 1000 Ton Four Column Press is an example of Watson-Stillman engineered-for-the-job hydraulic press. The main ram, 29" in diameter, has a stroke of 28". The platen surface is 42" x 42". In spite of its size, this press operates with an advance speed of 440, a pressing speed of 20 and a return speed of 600 inches per minute, making it possible to attain high production speeds on large work.

WATSON-STILLMAN

To get greatest efficiency in operation, Watson-Stillman presses are "engineered" to each particular job by a staff of experts thoroughly familiar with every phase of press design and construction, and the scope of press operations. Our 85 years of experience qualifies us as experts in providing the exact press to do your jobs with greatest efficiency. For any job of bending, forming, extruding or straightening, get in touch with our engineering department. THE WATSON-STILLMAN COMPANY, 103 Aldene Road, Roselle, N. J.

HYDRAULIC PRESSES FOR EVERY PURPOSE
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HIGH PRESSURE PUMPS
•
ACCUMULATORS
HYDRO-PNEUMATIC
WEIGHTED TYPES
•
OPERATING VALVES
•
LEATHER PACKINGS
•
FORGED STEEL FITTINGS

W-S HYDRAULIC

Navy Department Awards Contracts

WASHINGTON—The Navy Department's Bureau of Supplies and Accounts has awarded the following contracts:

Alan Wood Steel Co., Conshohocken, Pa., $70,576 for steel plates; American Rolling Mill Co., Middletown, Ohio, $11,833 for corrosion resisting steel; Lukens Steel Co., Coatesville, Pa., $21,565 for high-tensile steel plates; Republic Steel Corp., Massillon, Ohio, $5659 for corrosion resisting steel; Northill Co., Inc., Los Angeles, $15,782 for anchors, folding, steel; Chambersburg Engineering Co., Chambersburg, Pa., $6215 for pneumatic drop hammer; Baldwin-Southwark Corp., Eddystone, Pa., $58,900 for machine, plate bending rolls; Buffalo Pumps, Inc., Buffalo, $305,400 for pumps, turbine and motor drive, and parts; Grumman Aircraft Engineering Corp., Bethpage, Long Island, N. Y., $8929 for airplane parts; Leece-Neville Co., Cleveland, $75,124 for power boat diesel engine parts; Lodge & Shipley Machine Tool Co., Cincinnati, $37,655 for precision lathes; Communication Development Corp., Newark, N. J., $21,185 for localizer beam and control transmitter equipment; and the Aluminum Co. of America, Washington, $13,695 for aluminum alloy. The Bureau of Yards and Docks has awarded a $8261 contract to the Kinnear Mfg. Co., Columbus, Ohio, for steel rolling doors to be used at the Boston Navy Yard.

1938 Steel Output In France Declines

WASHINGTON—Reports to the Commerce Department are that French steel production during 1938 was 25 per cent less than in 1937 despite the higher production level maintained during the latter part of 1938. While the trend toward increased production, which started after the low record in August, 1938, continued through November, total production for the first eleven months of 1938 amounted to only 5,604,000 metric tons as compared with 7,214,000 tons during the corresponding period in 1937.

Wisconsin Compensation Act May Be Liberalized

MILWAUKEE — Identical bills have been introduced into the upper and lower houses of the Wisconsin Legislature to liberalize provisions of the Wisconsin workmen's compensation act, the first statute of its kind, enacted in 1911. The bills provide that men thrown out of work as the result of a strike, exclusive of the actual strikers, would be eligible to workmen's compensation. The bills also provide that the period of compensation pay be doubled, or from 13 to 26 weeks, and throw open to workmen's compensation benefits all workers in Wisconsin industry.

Steel Ingot Capacity 72,533,969 Tons; Pig Iron Capacity 50,290,920 Tons

THE annual capacity of the steel industry of the United States for the manufacture of ingots as of Dec. 31, 1938, is 72,533,969 gross tons, a gain of 1,468,429 tons over the rated capacity of 71,065,540 tons on Dec. 31, 1937, according to figures released by the American Iron and Steel Institute.

These figures do not include steel for castings produced in foundries owned by companies which also produce ingots. The capacity figure including such castings as of Dec. 31, 1938, is 73,061,569 tons compared with 71,594,320 tons as of Dec. 31, 1937.

The new capacity total for ingots is divided as follows: Basic open-hearth, 63,957,590 tons; acid open-hearth, 860,404 tons; total open hearth, 64,817,994 tons; bessemer, 6,374,000 tons; crucible, 4780 tons: electric, 1,337,195 tons.

Blast furnace capacity for the making of pig iron and ferroalloys as of Dec. 31, 1938, is 50,290,920 gross tons, divided as follows: Pig iron made in furnaces using coke as fuel, 49,252,120 tons; ferroalloys, 946,800 tons; charcoal pig iron, 92,000 tons. These figures are unchanged in the cases of ferroalloys and charcoal pig iron, but the coke pig iron capacity is 407,480 tons below the rated capacity of 49,659,600 tons as of Dec. 31, 1937.

Industrial Relations Executives Meet Feb. 15-17

THE mid-winter conference of the personnel division of the American Management Association—will be held on Feb. 15-16-17, at the Palmer House in Chicago. The three-day meeting will bring together personnel and industrial relations executives and authorities throughout the nation. The conference will be under direction of C. R. Dooley, manager of industrial relations, Socony-Vacuum Oil Co.

Steel Employment Lower In December

REFLECTING the decline in steel production last December, both steel employment and payrolls were slightly below November, according to the American Iron and Steel Institute.

Although output dropped 14 per cent, employment declined only one-fourth of 1 per cent, from 450,000 to 449,000 employees. Total payrolls declined 3 per cent, from $61,054,000 to $59,254,000.

The December figures brought steel payrolls to a total of $613,199,000 for the year, a decline of 37 per cent from the record total of $976,000,000 for 1937. Average number of employees in 1938 was 443,000, or 23 per cent below the 1937 record of 572,000. By comparison, steel output in 1938 was 44 per cent below the year before.

Wage-earning employees of the industry received an average of 83.5c. per hr. in December which compares with the same figure in November and with 81.7c. per hr. in December, 1937.

An average of 32.0 hr. per week was worked by wage earners in December, as against 34.2 hr. in November and 23.4 hr. in December, 1937.

● Steel Mill engineers laid down the specifications for an ideal ram truck, to embody all the requirements of the modern strip mill for efficiency, safety, and economy. Baker designed and built the Type JO-150 specifically to meet these exacting requirements. It sets new standards of performance for steel handling equipment—and emphasizes once more the fact that *handling costs can be and are being cut with Baker trucks.*

Model JO-150, capacity 15000 lbs., 540,000 inch lbs. Wheelbase 73", outside turning radius 115 inches. Turns with maximum coil in intersecting aisles 104 inches wide. May be furnished tilting or non-tilting. Tractors of similar design are available in capacities from 8000 lbs. to 30,000 lbs.

Features included in this new ram truck are power steer, full contactor control with automatic acceleration, frame of high carbon steel plate, hydraulic wheel brakes, strongest drive axle ever used, easiest accessibility to all units.

OLDEST MANUFACTURER Baker OF ELECTRIC VEHICLES

BAKER INDUSTRIAL TRUCK DIVISION
OF THE BAKER-RAULANG COMPANY
2175 WEST 25TH STREET • CLEVELAND, OHIO

Many Armament Measures Are Launched in Congress

WASHINGTON — Following the pace set by the Administration in its proposed $1,319,000,000 national defense program, Congressional members are launching armament bills in quantities reminiscent of World War days.

Many of the measures reflect the emphasis placed on air defenses by the President in his national defense message to Congress in which he requested $300,000,000 for army planes. Many follow specifically other recommendations made by the President, some propose to carry out details suggested by the War and Navy Departments, and others have only individual sponsors, most of whom hope to obtain Administration support. A few of the bills, and their major features, follow:

S-843 by Senator Sheppard, Democrat of Texas, and chairman of the Senate Military Affairs Committee—a bill authorizing an expenditure of $32,500,000 during the next four years for placing educational orders to familiarize private manufacturers with Government requirements for special tools and the production of munitions of special or technical design.

Exchange of Machinery

S-1083 by Senator Sheppard—a bill to authorize the Secretary of War to exchange obsolete, unsuitable and unserviceable machines and tools for new machines and tools necessary in the manufacture or repair of ordnance material. No amount is suggested in the measure to cover the cost involved.

S-1018 by Senator Sheppard—a measure empowering the War Department's Chief of the Air Corps to purchase aircraft parts, instruments or aeronautical accessories without adhering to the usual Government requirement of advertising for bids, where the confidential character of the orders requires it.

S-842 by Senator Sheppard—a bill authorizing the Secretary of War to equip and maintain the Air Corps with not less than 6000 serviceable airplanes.

H.R.3127 by Representative May, Democrat of Kentucky, and chairman of the House Military Affairs Committee—a bill authorizing the purchase by the Secretary of War, with or without competition, ordnance, signal and chemical warfare equipment, parts accessories deemed necessary for experimental or test purposes.

H.R. 3128 by Representative May—a measure empowering the War Department to lend to accredited civilian aviation schools its aircraft, equipment and accessories for instruction and training purposes under the projected air pilot training program.

Tenders, Tanker Requested

S-828 by Senator Walsh, Democrat of Massachusetts, and chairman of the Senate Naval Affairs Committee—a bill empowering the President to acquire and convert or to undertake the construction of one seaplane tender, one destroyer tender, one mine sweeper, one submarine tender and one fleet tug and one oil tanker, with a total displacement tonnage of 36,050, to cost not more than $50,000,000.

S-829—by Senator Walsh—a proposal to expend not more than $5,500,000 to modernize and repair the ships Argonaut, Narwhal and Nautilus.

S-572 by Senator Thomas, Democrat of Utah, and chairman of a Senate Military Affairs sub-committee — a measure providing that $25,000,000 be appropriated for obtaining and storing stocks of strategic and critical raw materials, concentrates and alloys of which this country has a deficient supply.

S-651 by Senator Schwellenbach, Democrat of Washington. A bill to "protect, preserve and develop domestic use of scrap steel" by prohibiting exports except by license issued by the President. A fine of not more than $500 would be imposed for violation.

The latter two bills were introduced during the last session of Congress but died with the adjournment. The Thomas bill is conceded to have a good chance of passing while the Schwellenbach measure, little if any. There has been renewed interest in both, however, wholly because of the national defense program. There are at least a dozen similar bills pending.

Walsh-Healey Sales For Week $428,703

WASHINGTON—Iron and steel Walsh-Healey contracts totaling $428,703.37 were awarded during the week ended Jan. 28. Machinery awards were $127,626.83 while electrical apparatus contracts amounted to $204,503.36 and transportation equipment, $271,740.53. Details follow:

Iron and Steel Products

Kilby Steel Co., Inc., Anniston, Ala., bolts	$66,112.00
Hoffman Hardware Co., Los Angeles, wire woven fences	13,480.87
Associated Piping & Engineering Co., Ltd., Los Angeles, fabricated pipe	15,800.00
Columbia Steel Co., San Francisco, reinforcing steel	67,929.23
Allegheny-Ludlum Steel Corp., Brackenridge, Pa., steel sheets & strips	30,831.65
Henry Disston & Sons, Inc., Philadelphia, armor plate	20,673.95
Joseph T. Ryerson & Son, Inc., Chicago, steel sheet	12,906.31
Republic Steel Corp., Massillon, Ohio, steel strip	16,238.78
Treadwell Construction Co., Midland, Pa., roller gates	59,960.00
Philips & Davies, Inc., Kenton, Ohio, gates and hoists	57,999.96
The Mills-Morris Co., Washington, D. C., dies, wrenches, etc.	11,655.02
Elliott Bros. Steel Co., New Castle, Pa., rolled steel	12,803.60
Bay State Tool & Machine Co., Springfield, Mass., water chests	42,312.00

Non-Ferrous Metals and Alloys

Chase Brass & Copper Co., Inc., Waterbury, Conn., copper rotating bands	$14,700.00
Scovill Mfg. Co., Philadelphia, nickel pieces	52,000.00
American Brass Co., Waterbury, Conn., copper nickel plates	23,473.68

Other Machinery

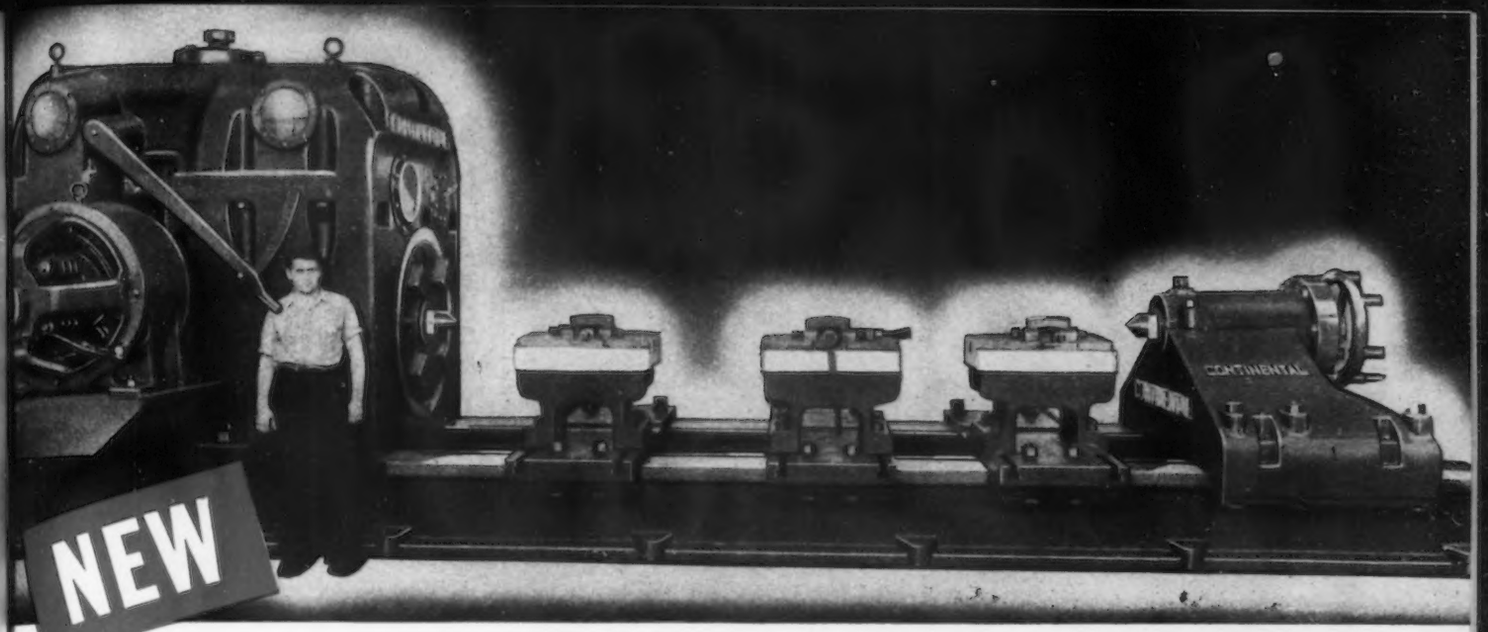
The Cincinnati Planer Co., Cincinnati, metal working planer	$20,920.00
Bay City Shovels, Inc., Bay City, Mich., excavator	13,800.00
Caterpillar Tractor Co., Peoria, Ill., tractors	24,544.50
R. G. LeTourneau, Inc., Peoria, Ill., wagon scrapers	13,496.00
Struthers Wells-Titusville Corp., Titusville, Pa., winches	18,436.00
Commercial Iron Works, Portland, Ore., radial gate hoists	15,590.00
Sterling Engineering Co., Milwaukee, valves	10,540.00
New Home Sewing Machine Co., Rockford, Ill., sewing machines	10,300.33

Electrical Apparatus and Supplies

United States Steel Products Co., Washington, D. C., lead sheathed copper cable	$13,218.61
General Cable Corp., New York, wire	121,080.00
The Crosby Co., Buffalo, reel	14,625.00
Ajax Electrothermic Corp., Trenton, N. J., electric furnace	32,619.00
NePage McKenny Co., Seattle, Wash., switchboard	10,978.00
Wm. J. Murdock Co., Chelsea, Mass., headset	11,982.75

Transportation Equipment

United Aircraft Corp., Pratt & Whitney Aircraft Div., East Hartford, Conn., aircraft engine parts	$46,709.05
Bendix Aviation Corp., Eclipse Aviation Div., Bendix, N. J., regulator assembly	12,075.00
Curtiss-Wright Corp., Curtiss Propeller Div., Clifton, N. J., aircraft propellers	25,200.00
Curtiss-Wright Corp., Curtiss Propeller Div., Clifton, N. J., hub and booster assembly	27,865.68
The Leece-Neville Co., Cleveland, generator assemblies	11,400.00
United States Gauge Co., New York, indicator assembly	12,560.00
General Motors Corp. (Chev. Div.), Detroit, automobiles	33,576.54
General Motors Corp., Chev. Div., Detroit, trucks	55,371.66
Yellow Truck & Coach Mfg. Co., Gen. Motors Truck & Coach Div., East Pontiac, Mich., trucks	20,986.60
Ingersoll Rand Co., Washington, trucks	26,000.00



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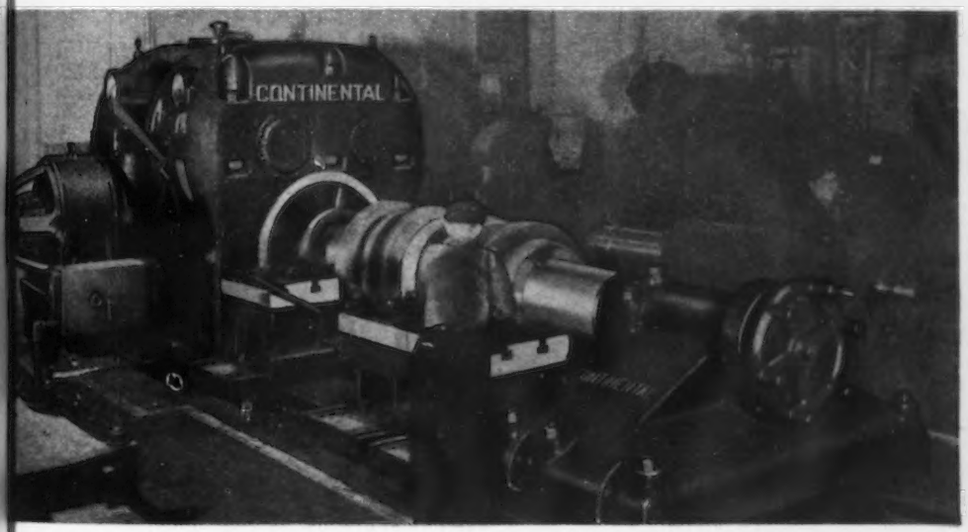
CONTINENTAL *ROLL LATHE*

Revolutionary Design, More Volume, Finer Work in Less Time



FOUR-POINT VISIBILITY—The new headstock desig provides four unbreakable inspection windows an interior illumination, permitting view of operatin mechanism and pressure lubrication at any tim

ANOTHER FIRST FOR CONTINENTAL

Modern high speed production demanded an advanced type roll lathe, and as usual, Continental engineers pioneered its development. Introducing the first radical changes in design in over 50 years this new roll lathe produces a greater volume of quality work in less time. It has no over-hung gears, no internal gears and pinions, no bronze bushings, no straight spur gears and no external lubrication. In their place are double helical cut gears, roller bearings, centralized pressure lubrication and oil seals. Now the full power of the motor is smoothly transmitted to the headstock and chatter is virtually eliminated. The traditional protruding face plate is concealed in the headstock for closer mounting, greater safety. New type tailstock facilitates centering and moving laterally to accommodate various lengths of rolls, making the new lathe ideal for heavy duty service.

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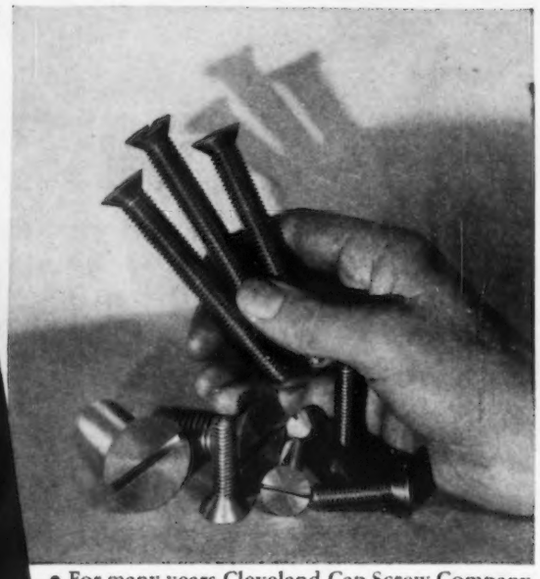

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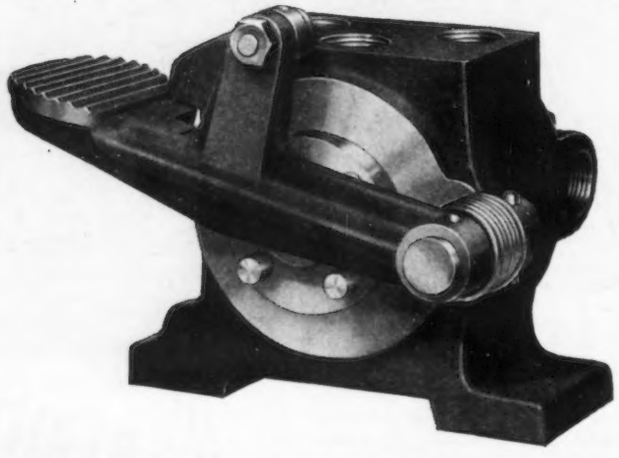

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Rotary ratchet action of this Hannifin Air Control Valve gives simple, positive control of air operated equipment. One pressure operates the cylinder, second pressure reverses the cylinder. The dependable disc-type valve design means long life and no leakage. Since there is no packing there is no packing maintenance.

Made in 3-way and 4-way types, hand and foot operated, spring return, electric, manifold, and special models. Write for Valve Bulletin 34-A.

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HANNIFIN *"Packless"* AIR CONTROL VALVES

Subpoenas May Be Used in Obtaining Trade Group Data

WASHINGTON — The Department of Commerce, which is currently attempting to placate business and sell industry on its newly-acquired secretary, may invoke the subpoena power of the TNEC to require about 15 per cent of the country's trade associations to file returns with the department as requested last September.

Although the questionnaires were sent out to 2300 trade associations on September 26, only about 85 per cent of the associations have supplied the requested data, causing some concern among departmental officials as to what their course of action should be. Under the TNEC's powers, the information can be subpoenaed by merely obtaining the approval of the anti-monopoly committee's subpoena committee.

Reports are that even the questionnaires which have been received by the department have thrown a heavy load on employees and that it will be some time before the information can be compiled into suitable form. When the questionnaire was drafted five months ago, it was announced that the data would provide "part of the information on which a report to the Temporary National Economic Committee is to be based." Commerce Department members of the TNEC expected and announced at that time that trade association officers would cooperate "100 per cent with the Bureau."

What Government Seeks

The data requested by the department included information dealing with management and affiliations of each association; officers and composition of membership; scope of activities; association personnel and outside organizations employed; income and balance sheet data including details on dues and assessments; present and future contributions to the affiliated industry; and copies of by-laws, publications, annual reports and a list of members.

The identity of the trade associations which have failed to file returns has not been disclosed.

Independent Air Filter Co., Chicago, has decided to discontinue its business. The affairs of the company are now in liquidation. Adequate arrangements have been made to complete all outstanding orders and continue indefinitely all required service to customers having Independent equipment.

. . . PERSONALS . . .

(CONTINUED FROM PAGE 51)

DR. MARCUS A. GROSSMANN, director of research of the Carnegie-Illinois Steel Corp., will conduct a week's lecture course, beginning March 24, for the San Francisco Golden Gate chapter of the American Society for Metals.

❖ ❖ ❖

CHARLES W. PENDOCK, president of the Le Roi Co., Milwaukee, manufacturer of internal combustion engines, air compressors, hoists, etc., has been elected president of the Milwaukee Association of Commerce. For many years he has directed the industrial safety activities of the organization and was first vice-president during the past two years.

❖ ❖ ❖

EUGENE A. LINDEMANN, general manager of the A. J. Lindemann & Hoverson Co., Milwaukee, pioneer manufacturer of coal, gas and electric stoves and ranges, electric heaters, etc., has been elected president and treasurer, continuing as general manager. For several years he has served as secretary and treasurer. WALTER C. LINDEMANN was reelected vice-president and appointed secretary. A. L. LINDEMANN resigned as president last September. All are sons of A. J. LINDEMANN, who founded the business in 1893 with the late Hans Hoverson, and is now chairman of the board.

❖ ❖ ❖

GEORGE S. DENITHORNE has resigned as district sales representative of the Medart Co., St. Louis, to devote all of his time to the practice of consulting engineering, with office at State College, Pa.

❖ ❖ ❖

GARLAND R. JOHNSON, vice-president in charge of sales, and J. S. WRIGHT, treasurer of the Lynchburg Foundry Co., Lynchburg, Va., have retired.

❖ ❖ ❖

ELMER C. KIEKHAEFER, until recently chief engineer for the Stearns Magnetic Mfg. Co., Milwaukee, has been made vice-president in charge of engineering of the Kiekhaefer Corp., Cedarburg, Wis.

❖ ❖ ❖

CHARLES W. NASH, veteran of the automobile industry, celebrated his 75th birthday at his home in Beverley Hills, Cal., on Jan. 28.

❖ ❖ ❖

ALBERT J. NESBITT has been elected president of the Industrial Unit Heater

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TRACTORS CUT HANDLING COST

Straight gas powered for greater economy and 24 hour uninterrupted service at full capacity. Heavy duty pushing and pulling power. **Rugged, compact construction** for short turning in narrow aisles and close quarters. **Seated center control** for greater safety, comfort and visibility. High speed forward and reverse. Low initial cost and lowest cost per ton moved. Write for TOWMOTOR Tractor and Lift Truck catalog today.

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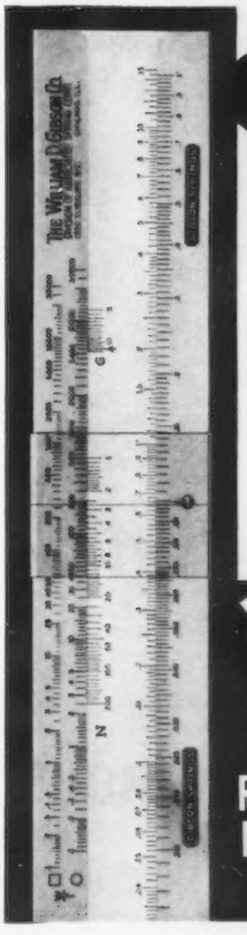

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Association, Detroit. J. F. G. MILLER has been made vice-president, and L. O. MONROE, secretary-treasurer.

❖ ❖ ❖

LESTER A. LANNING, heretofore chief metallurgist of New Departure, division of General Motors Corp., Bristol, Conn., has been promoted to assistant plant manager. He was formerly superintendent of the heat treating division and is a member of the American Society for Testing Materials, the British Iron and Steel Institute, and the American Society for Metals. JOHN C. KIELMAN, formerly assistant superintendent of the heat treating division, has been appointed superintendent of that division.

❖ ❖ ❖

J. B. HASKELL, for the past 15 years superintendent of the frog and switch department of the West Virginia Rail Co., Huntington, W. Va., has been appointed sales manager of the rail and track work division of that company. He has been identified with the design and manufacture of track work for many years, having previously been associated with the American Frog & Switch Co. for 14 years as draftsman, engineer and assistant superintendent.

❖ ❖ ❖

ROBERT W. LEA, who has been president of the West Virginia Coal & Coke Co., has been elected a vice-president of Johns-Manville Corp. He will be in charge of finance and will take over the post formerly held by E. M. VOORHEES, who left Johns-Manville to become chairman of the finance committee of the United States Steel Corp.

❖ ❖ ❖

HARRY H. WEINING, who has been identified with the Northern Equipment Co., Erie, Pa., since his graduation from Pennsylvania State College in 1926, has been placed in charge of research concerned with the Copes system of boiler feed control.

❖ ❖ ❖

KEITH C. BOWERS, formerly of the St. Louis office of Revere Copper & Brass, Inc., Chicago, has been made sales representative for western Missouri and Kansas, with headquarters at 325 Ward Parkway, Kansas City.

❖ ❖ ❖

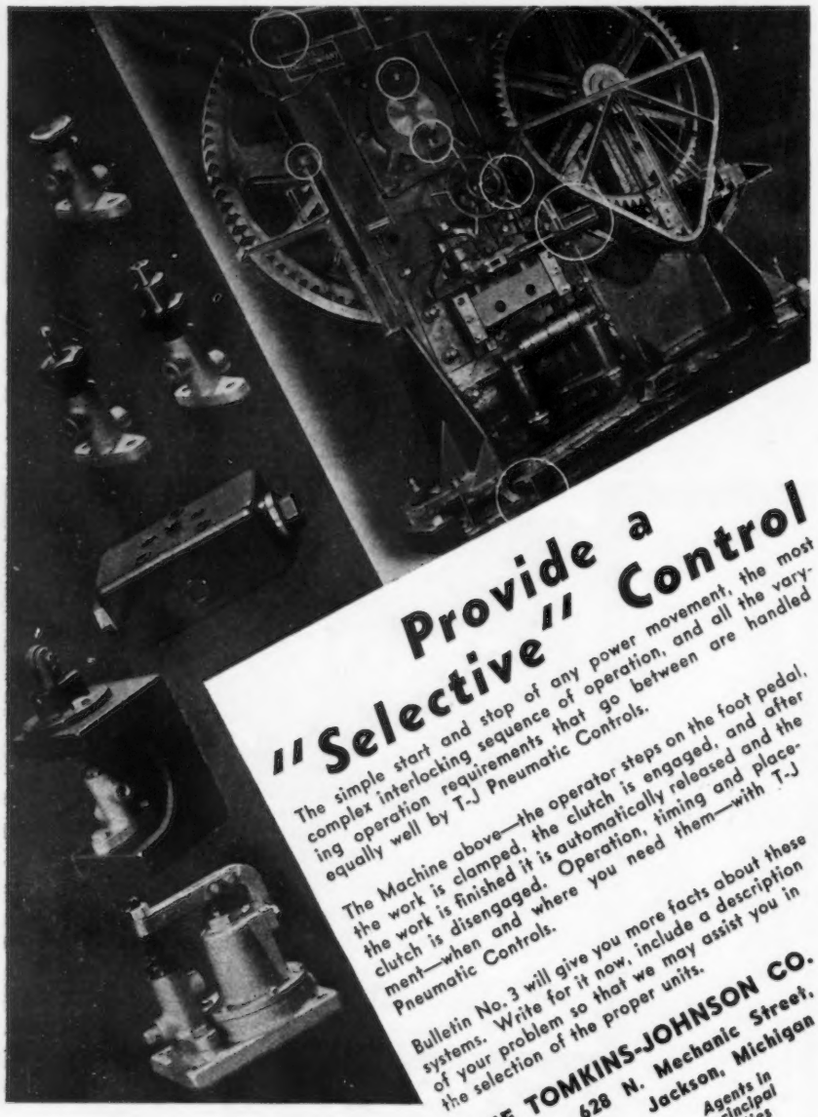
L. E. PECK has been appointed Midwest district sales manager for the Lake Erie Engineering Corp., Buffalo. He will make his headquarters at 1540 East 53rd Street, Chicago.

❖ ❖ ❖

LLOYD H. SKOUGOR has been made research engineer of the American Leather Belting Association and will offer members of the association consulting engineering service in mechanical power transmission problems in the industrial field.

❖ ❖ ❖

PROF. FRANK B. ROWLEY, director of the engineering experiment station of the University of Minnesota, has been awarded the American Society of Heating and Ventilating Engineer's Medal "for distinguished scientific achievement in heating ventilating and air conditionng."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The Machine above—the operator steps on the foot pedal, the work is clamped, the clutch is engaged, and after the work is finished it is automatically released and the clutch is disengaged. Operation, timing and placement—when and where you need them—with T-J Pneumatic Controls.
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Carrier Corp. Sales At Peak in January

AIR conditioning equipment sold by Carrier Corp., Syracuse, N. Y., during the last two weeks of January called for the largest volume of refrigeration for any half month since 1937, J. I. Lyle, president, announced.

. . . OBITUARY . . .

WILLIAM P. BRADBURY, vice-president and general sales manager of the Consolidated Ashcroft Hancock Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., died of pneumonia on Jan. 14, aged 53 years. He joined the company as an office boy in 1902 and he advanced through various positions in the sales department. In 1923 he was made general sales manager and seven years later vice-president in charge of sales.

W. P. BRADBURY

❖ ❖ ❖

CARL F. LOMB, vice-president of the Bausch & Lomb Optical Co., Rochester, N. Y., died at his home in that city on Jan. 26. He came to this country in 1873 and, after being identified with the banking business for a short time, became associated with the New York office of the Bausch & Lomb company. In 1882 he was elected secretary of the company and in 1909 was made a vice-president.

❖ ❖ ❖

JAMES H. GRAY, for almost 25 years chairman of the open-hearth committee of the United States Steel Corp., died on Jan. 13. He had been retired since 1924.

❖ ❖ ❖

BURTON M. PHEATT, sales manager of the stamping division of Murray Corp. of America in Detroit, died Feb. 1 from the effects of a cerebral hemorrhage. Mr. Pheatt fell unconscious while shoveling snow in front of his home in Birmingham, Mich. Born in Milwaukee, Feb. 23, 1889, Mr. Pheatt was a graduate of the University of Wisconsin, went to Detroit in 1913 and joined the Murray Corp.

❖ ❖ ❖

MARK D. KUHN, vice-president, Dreifus Co., Pittsburgh, died suddenly at his home in Pittsburgh on Feb. 2. Mr. Kuhn was connected with the company for the past 40 years and was vice-president for many years. He was 68 years old.

FRED ENGLAND, SR., 72 years old, died Jan. 30 at his home in Lansing, Mich. In 1912 Mr. England went to Detroit to found the England Mfg. Co. which he headed until his retirement in 1922.

❖ ❖ ❖

JULIUS RASMUSSEN, secretary and treasurer of the Rasmussen Leather Co., Milwaukee, died on Jan. 28, aged 70 years. He emigrated from Germany in 1887 and helped found a factory in Milwaukee shortly thereafter, being

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"NO DANGER OF SENDING THE WRONG KIND OF STEEL TO THE SHOP. THE COLOR COATING SHOWS THE GRADE AT A GLANCE."
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"NO TIME LOST AND TOOLS RUINED WORKING THE WRONG STEEL. THE COLOR IDENTIFIES IT, NO MATTER HOW SMALL THE PIECE."
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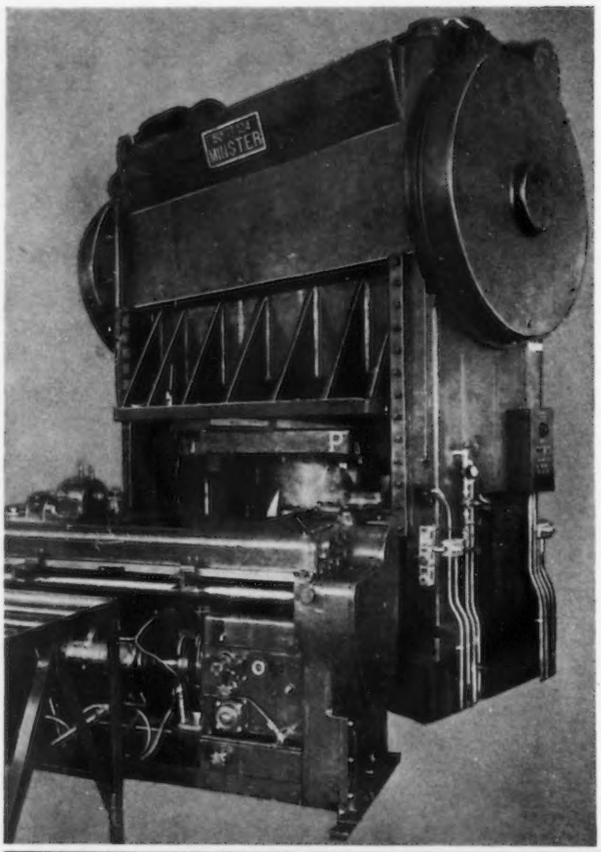

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considered the first manufacturer of leather belting in Milwaukee.

❖ ❖ ❖

RAY A. NORTH, president of the Green Bay Foundry & Machine Co., Green Bay, Wis., died on Jan. 27, aged 66 years. The firm specializes in paper and pulp mill machinery. Before becoming head of the Green Bay concern in 1914, Mr. North was associated with the R. J. Dowd Co., Beloit, Wis., manufacturer of knives and paper cutting blades.

Germany Orders Use of Light Metals, Replacing Steel

LONDON—Outlining the system of State control of production at the annual conference of the National Socialist Economic Policy Committee, recently held in Munich, General Von Hanneken declared that one of the chief problems was the supply of iron and the exploitation of the low-grade German ores.

In 1938 Germany's output of iron ore totaled 15,000,000 tons. yielding 4,000,000 tons of pig iron. During the last few months of the year nearly 1,400,000 tons of iron were produced and a big increase is to be expected this year.

Wherever possible, General Von Hanneken said, non-ferrous metals, especially magnesium and magnesium alloys, of which unlimited supplies are available in Germany, are being substituted for steel and iron. Industries have been ordered to supersede iron by light metals and as a result the automobile trade is using magnesium alloys to an increasing extent. The armament plants have first call on the available supplies of iron and steel.

Laminated Shim Co. in Business 25 Years

LAMINATED SHIM CO., INC., Long Island City, N. Y., recently celebrated its 25th anniversary. The company was organized in December, 1913, by Carlton N. Aborn, president, and several associates, to manufacture a new laminated shim material. First automobile to be equipped with Laminum shims was the 1913 model Hupmobile, according to the company's officers. Pumps, compressors, industrial engines, diesels, and machine tools are among Laminum shim applications. Louis R. Tiemann is in charge of the company's plant and tool maintenance.

Wisconsin Foundrymen Will Meet Feb. 16-17

THE annual regional foundry conference sponsored by the Wisconsin chapter, American Foundrymen's Association, and the College of Engineering of the University of Wisconsin, will be held this year at the Schroeder Hotel, Milwaukee, on Feb. 16 and 17, B. D. Claffey, General Malleable Corp., Waukesha, Wis., secretary of the foundrymen's group, announces.

Among subjects to be discussed are aluminum alloys, melting practices, annealing, job evaluation, scrap, core room practices, gates and risers and molding sands.

The committee arranging the conference includes: Charles I. Wesley, Wesley Steel Treating Co., and Prof. E. R. Shorey, University of Wisconsin, co-chairmen, R. S. MacPherran, Allis-Chalmers Mfg. Co., David Zuege, Sivyer Steel Casting Co., E. Meyer, Chain Belt Co., O. Frohman, Ampco Metal, Inc. and Prof. J. E. Oesterle, University of Wisconsin.

World Foundry Congress To Be Held in London

THE International Foundry Congress of 1939 will be held in London from June 12 to 17. The congress has been arranged by the Institute of British Foundrymen under auspices of the International Committee of Foundry Technical Associations.

Wheeling Steel Buys Atlas Supply Co.

WHEELING STEEL CORP., Wheeling, W. Va., has purchased the Atlas Supply Co., Muskogee, Okla., distributer of oil country supplies. The Atlas Supply Co. operates 16 stores, located in the oil fields of Oklahoma, Texas, and Kansas. No change in policy is contemplated and the Atlas organization will remain unchanged under the direction of J. H. McDonald, president.

150 Attend Blaw-Knox Sales Convention

BLAW-KNOX CO., Blawnox, Pa., last week closed a four-day sales convention, attended by 150 of its district office representatives. William P. Witherow, president, and Chester H. Lehman, executive vice-president, addressed the group.

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CAMBRIDGE CLEVELAND CHICAGO NEWARK DETROIT BUFFALO

. . . THE NEWS IN BRIEF . . .

Weather cuts auto production, but rebound is indicated. Million car output seen for first quarter. Lack of mechanical changes to be felt in decreased machine tool programs. Ford opens press shop and tool and die shop to visitors. —**Page 52.**

The engineer may yet be the politicians' demon, former President Hoover says at Stevens alumni dinner.—**Page 54.**

Producing largest possible amount of goods is way to prosperity, C. Donald Dallas, president, Revere Brass & Copper Co., says in his new book.—**Page 55.**

Building activity, though mostly public works, continues to show promise of one of the most active first quarters in several years.—**Page 55.**

Electrical equipment for six streamlined trains to be placed in service by Southern Railway, is ordered from Westinghouse Electric & Mfg. Co.—**Page 55.**

State Department still opposes legislation to prevent scrap and pig iron exports.—**Page 56.**

Wisconsin workmen's compensation act may be liberalized to protect non-striking workers in event of walkouts.—**Page 58.**

Navy Department's Bureau of Supplies and Accounts awards long list of contracts for armament needs.—**Page 58.**

Steel production in France during 1938 is reported 25 per cent under 1937 despite dangers of war.—**Page 58.**

The American Management Association's personnel division will hold its mid-winter conference at Chicago, Feb. 15-17.—**Page 59.**

Steel industry employment in December dropped one-fourth of 1 per cent as production declined 14 per cent.—**Page 59.**

Steel ingot capacity, revised by American Iron and Steel Institute, 72,533,969 tons; pig iron capacity, 50,290,920 tons.—**Page 59.**

Steel ingot rate in January was 52.69 per cent and production totaled 3,186,834 tons, according to American Iron and Steel Institute.—**Page 59.**

Many armament bills, remindful of World War legislation, are introduced in Congress.—**Page 60.**

Government buying of iron and steel products totals $428,703 in latest reported week.—**Page 60.**

Department of Commerce may use subpoenas to obtain information from trade associations failing to submit information on their affairs.—**Page 62.**

Air-conditioning equipment sales were higher in first half of January than in any similar period since 1937.—**Page 64.**

Laminated Shim Co., Long Island City, N. Y., celebrates its 25th anniversary.—**Page 66.**

Wheeling Steel Corp. purchases Atlas Supply Co., Alabama, distributer of oil country supplies.—**Page 67.**

One hundred and fifty attend 4-day sales conference held by Blaw-Knox Co.—**Page 67.**

International Foundry Congress of 1939 will be held in London, June 12-17.—**Page 67.**

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Machine Tool Activity	96

MEETINGS

Feb. 9 to 11—Conference of iron, steel and allied industries, Del Monte, Cal.

Feb. 14 to 17—Purchasing Agents Association, Indianapolis.

March 14 to 18—American Society of Tool Engineers, Detroit.

March 16 and 17—Society of Automotive Engineers, Washington.

Oct. 23 to 27—National Metal Congress, Chicago.

Annual regional foundry conference sponsored by the Wisconsin chapter, American Foundrymen's Association, will be held Feb. 16-17, at Milwaukee.—**Page 67.**

Salesman in 1939 must be informed, honest, confident, Steel Founders' Society annual meeting is told.—**Page 70.**

Cooperative union requests restriction of wire and nail production in Belgium.—**Page 70.**

A symposium on surface finishing will be a feature of the American Society of Tool Engineers' convention at Detroit, March 14-18. **Page 71.**

Acklin Stamping Co. holds "open house" in its plant at Toledo, Ohio, demonstrates new hydraulic press.—**Page 72.**

Penn Metal Corp., Philadelphia, celebrates 70th anniversary of its founding at Staunton, Va.—**Page 72.**

Kilby Car & Foundry Co., Anniston, Ala., changes its name to Kilby Steel Co.—**Page 74.**

Members of the Business Advisory Council are cooperative, Harry Hopkins finds in his new Commerce Department job.—**Page 74.**

1938 imports lowest in 17 years. December shipments down. — **Page 76.**

Production of coke pig iron in January on a daily basis dropped 1.5 per cent.—**Page 76.**

Langdon S. Simons, formerly sales manager of Norton Co.'s English factory, takes charge of the Steel Export Association of America's New York office.—**Page 93.**

American Steel Warehouse Association will hold its 30th annual convention at the Drake Hotel, Chicago, May 16-17.—**Page 93.**

ICC denies railroads' application to continue reduced carload rates on iron and steel products from midwestern points to St. Paul, Minneapolis, Duluth.—**Page 93.**

Machine tools show slight improvement in domestic ordering. Needs of aircraft engine builders furnishing backlog of market in the East.—**Page 96.**

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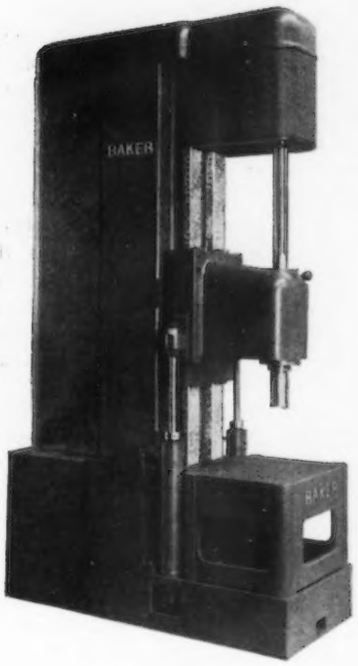
FOR DRILLING, TAPPING, BORING AND REAMING

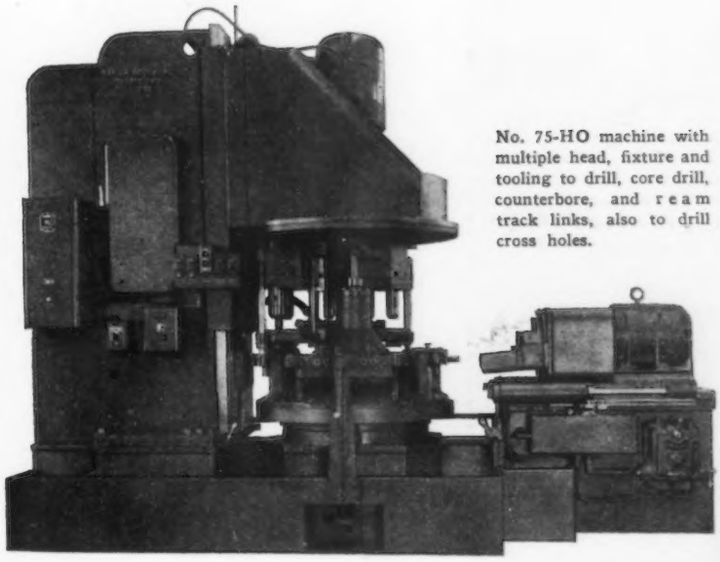


No. 20-HO Standard single spindle drilling machine, manufacturing gear box on frame type with plain table, hydraulic feed.

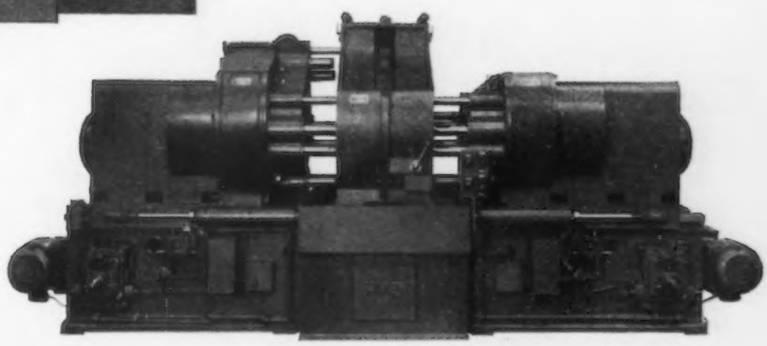
The efficient performance of Baker equipment is demonstrated by the Baker equipment in use in the most exacting plants in the country.

Several typical up-to-date machines are shown. In addition to these, Baker gear feed machines, keyseaters and contour grinder are available. The standard machines are made in a range of sizes and the special machines are adaptations necessary to handle any special production work.

Ask our engineering department to recommend or design a machine to handle your work. Write Baker Brothers, Inc., Toledo, Ohio or 1060 Broad St., Newark, N. J.



No. 75-HO machine with multiple head, fixture and tooling to drill, core drill, counterbore, and ream track links, also to drill cross holes.



No. 30-HH Baker two way horizontal hydraulic feed — two multiple heads — hand indexing to five stations—each cycle two parts drilled, core drilled and chamfered, rough reamed, and line reamed from one side.

★BAKER★

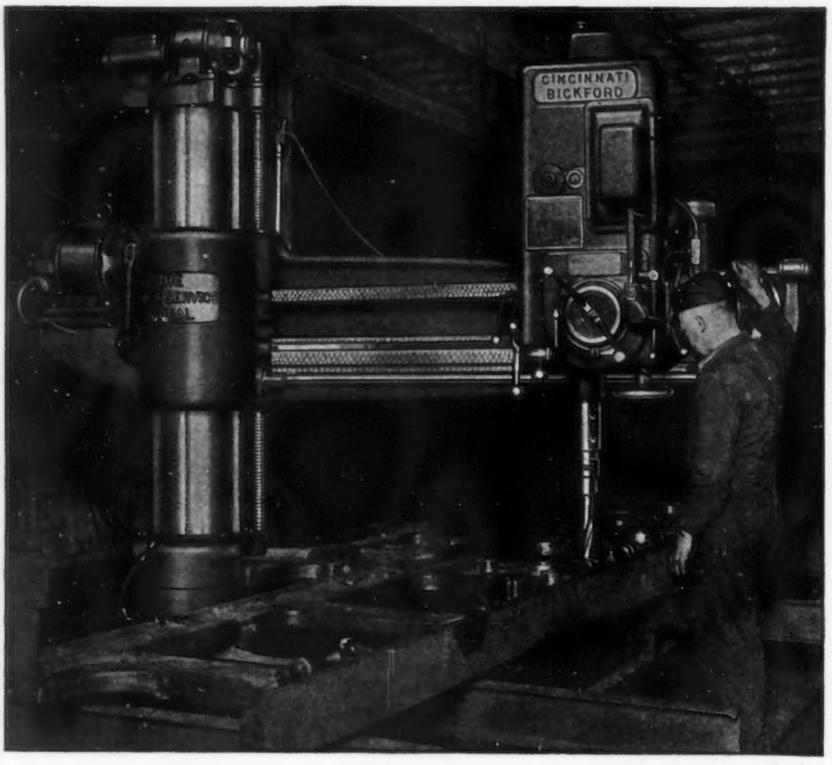
Salesmen Must Be Informed, Steel Founders Are Told

CHICAGO — Fundamentals of good salesmanship for 1939 include thorough knowledge of the product, complete honesty, and confidence, said Claude L. Harrell, Sterling Steel Casting Co., East St. Louis, Ill., in a paper for presentation here before the annual meeting of the Steel Founders' Society of America, on Wednesday, Feb. 8.

"A salesman must know his product, but he is not always wholly to blame for his lack of knowledge," said Mr. Harrell. "You can blame the firm who sends a man out unequipped to cope with the many problems he must face, and the economic loss which they entail. A salesman who is truly a representative of his firm should have complete knowledge, not only of his own products and a good knowledge of his competitors', but of the policies of his company, so that he can make decisions in the field at the point of sale, thereby gaining the confidence of the buyer.

"In our industry, it is essential that the salesman have a broad knowledge of the manufacture and use of the product. He must not only be able to present convincing arguments to the buyer, but he must have sufficient understanding of engineering and application of steel castings to talk intelligently with engineers and designers. These are the men who specify the materials used in their equipment, and it is our assignment as salesmen to build confidence in steel castings and see that they are specified in their proper places and not replaced with substitutes.

A technical session was scheduled for Feb. 9, the last day of the two-day convention. Reports of committees were delivered Feb. 8. The advertising and trade promotion committee, headed by Clarence Tolan, Jr., reported as one of its recent activities the development of the Frederick Lorenz memorial medal, for presentation this year to Mrs. Lorenz and her family, and in future years to that member of the industry who has made the most meritorious contribution to the industry during the preceding year. The cost and accounting committee headed by W. J. Corbett recommended a job cost system requiring few if any changes in basic accounting methods.



Convenient Low Controls
At the Head
Essential For Work Like This

Especially on big work centralized control at the drilling position makes important savings. Controls for all speeds and feeds—electric column clamping—arm clamping and elevation to the arm—power rapid traverse—controls for these and all other operations of the SUPER SERVICE RADIAL DRILLS are always within easy reach from the drilling position. Think what time and energy are wasted when that is not the case! Yet most of the radial drills in use today do not have this money saving feature of 100% centralized control at the head. Do yours?

Write for Bulletin R-24.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY CINCINNATI OHIO U.S.A.

Belgian Wire Output Restriction Requested

WASHINGTON—Restriction of production in the wire drawing and nail industry has been requested of the Belgian government by the cooperative union in this industry, according to a report to the Department of Commerce from the office of the American Commercial Attache at Brussels. Members of the union have voluntarily agreed among themselves to limit production to 60 per cent of what it was Dec. 31, 1938, for a period ending Dec. 31, 1941. It was stated that they have also agreed not to establish new plants in Belgium or Luxemburg during this period.

Lea Mfg. Co., Waterbury, Conn., has been appointed New England distributer for Maizo, a product made by the Maizo Mills of Circleville, Ohio. Maizo is a platers drying material.

Symposium on Surface Finishing A Feature of Coming A.S.T.E. Convention

A SYMPOSIUM on surface finish—with proponents of all methods of accurate surface finishing presenting papers on grinding, lapping, diamond boring, honing, Superfinishing, will be a highlight of the 1939 convention of the American Society of Tool Engineers, to be held in Detroit, March 14 to 18.

A second symposium, entitled New Developments and their effect on the Tool Engineer, will bring together in one evening session a highly important group of papers on new methods, materials and equipment.

There will be no day-time technical sessions, leaving tool engineers and production supervisors, free to visit the 1939 Machine and Tool Progress Exhibition as well as the numerous industrial plants in Detroit. General opening of the convention will be Tuesday morning, with registration at Convention Hall, where technical sessions as well as the exhibition are to be held. On Tuesday evening J. R. Weaver, director of equipment, purchases, inspection and tests, Westinghouse Electric & Mfg. Co. will lead off the discussion, followed by papers by representatives of Ex-Cell-O Corp., Micromatic Hone Co., Heald Machine Co., Chrysler Corp. and others. The session is under the direction of Carl J. Oxford, chief engineer, National Twist Drill & Tool Co. The session devoted to New Developments is scheduled for Thursday evening. It is under the direction of Chris H. Bornemand, supervisor tool and gage service department, General Electric Co., Schenectady. The annual dinner is scheduled for Friday evening, March 17.

Homer Bayliss, Motch & Merryweather Machinery Co. is general program chairman for the Convention, assisted by William Sherman, Detroit editor, THE IRON AGE.

It is planned also to continue the policy adopted last year by the A.S.T.E. of rebating to all members attending the show at their own expense, a sizeable portion of their railroad fare to Detroit, at so much per mile, thus enabling attending members to share directly in the success of the 1939 exhibition.

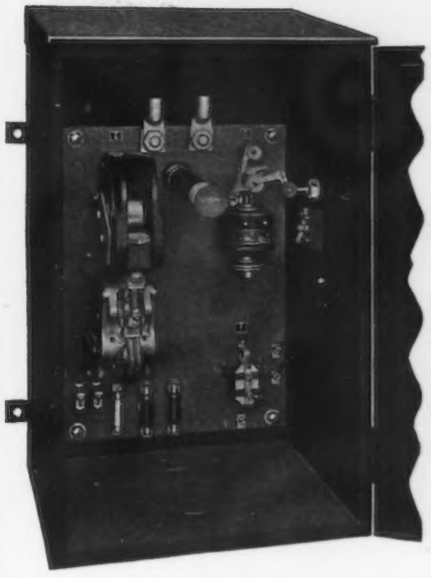
Each exhibitor at the show is being furnished free of charge with 100 engraved invitations. Each chapter is receiving a similar number of engraved invitations. Every member of the A.S.T.E., of course, will receive his own invitation. A registration fee of 50c. will be charged for all non-members not carrying invitations. This method of handling attendance at the show has been decided upon to restrict attendance to those having a definite business interest in the exhibition and technical meetings.

Preview Dinner

On Monday evening, March 14, there will be a special preview dinner to which leading industrialists, educators, editors, ministers, legislators, etc., are being invited. At this dinner, sponsored by a committee of industrialists, headed by K. T. Keller, president, Chrysler Corp., the Fact Finding Committee of the A.S.T.E., under

SECTIONALIZE Power Circuits with the

EC&M *LINE-ARC Repeating* SECTIONALIZER



for power feeders serving cranes, crane runways, etc.

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also for coal and ore mines

Confine power interruptions to section in which disturbance occurs; thus raising production, reducing maximum demand power peaks and also number of operations on main circuit breaker.

This new EC&M Low-cost Sectionalizer provides, for the first time, an inexpensive means of greater sectionalization than has heretofore been possible. Greater Sectionalization means fewer machines will be affected when a disturbance occurs and there may be a considerable saving in power costs since fewer machines need to be restarted when power is restored. Peaks on generating equipment will also be less. Use the convenient coupon below for complete information. Mail it to-day.

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HEAVY DUTY MOTOR CONTROL FOR CRANES, MILL DRIVES AND MACHINERY • BRAKES • LIMIT STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIMERS

THE ELECTRIC CONTROLLER & MFG. CO.
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Gentlemen:
Please send me Folder 1400 describing the new EC&M Line-Arc *Repeating* Sectionalizer.

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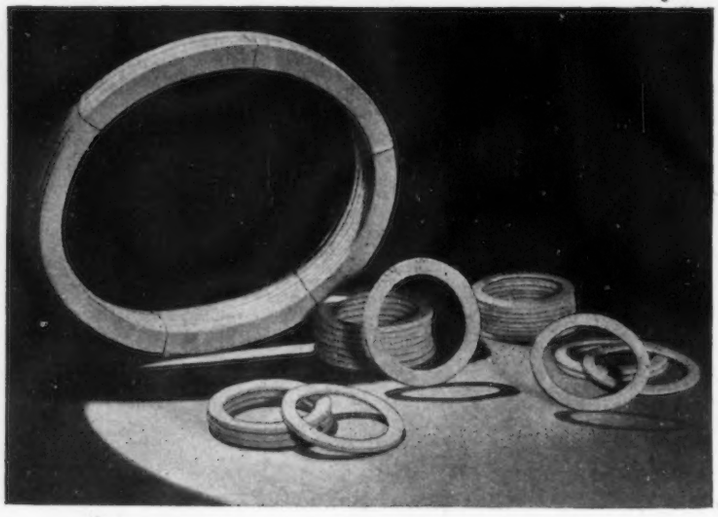
Company.....

Address.....

Professor John M. Younger, Ohio State University, will present its first report on the relationship of the machine to employment and standard of living. This committee is composed of such men as Professor Younger, chairman; James R. Weaver; John J. Caton, Chrysler Institute of Technology; Prof. O. W. Boston, University of Michigan; Prof. Carl Horack of California; L. Clayton Hill, president, Dietrich, Inc.; E. W. Dickett, Sundstrand Machine Tool Co. and Ford R. Lamb, executive secretary, A.S.T.E.

Already the committee has accumulated a mass of facts, a digest of which will form part of its first report to the society and the nation as a whole. In its studies, it is endeavoring to tie together the various relationships of the machine and employment—the machine and standard of living—the inter-relationship of industry and agriculture as affected by the machine—the contributing factors of legislation, taxation, developments in labor organization, etc., the creation of service employment—the problem of shifts in occupation as either produced or facilitated by the machine—possible contributions by trade schools—distinguishing between temporary as compared with permanent unemployment—the effect of and on the business cycle on and by the machine, etc.



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Guard against the expense of shutdowns caused by frequent gasket replacements—use GARLOCK 604 Folded Asbestos Gaskets for boiler handholes and manholes and other high pressure steam service. Made by skilled craftsmen from highest grade materials to rigid specifications, GARLOCK 604 Folded Asbestos Gaskets are your best insurance against gasketing trouble. Try GARLOCK 604's.

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GARLOCK

Penn Metal Founded 70 Years Ago

THE Penn Metal Corp. of Pennsylvania, Philadelphia, is celebrating the 70th anniversary of its founding in Staunton, Va., where, during 1869, L. L. Sagendorph organized what later became the Penn Metal company.

In 1883 Mr. Sagendorph moved his business to Cincinnati, where it became the Sagendorph Iron Roofing & Corrugating Co., a concern later sold to George M. Verity and moved to Middletown, Ohio, as the American Rolling Mill Co.

Mr. Sagendorph was owner of patents on roofing sheets and pioneer in the use of metal for ceiling and sidewall use. In 1924 the Sagendorph interests purchased the Dexter Metal Mfg. Co., of Camden, N. J. When the business outgrew its location at 25th and Wharton Streets, Philadelphia, it was moved to its present location at Oregon Avenue and Swanson Street. G. A. Sagendorph is its president.

Acklin Stamping Co. Holds "Open House"

THE Acklin Stamping Co., Toledo, Ohio, maker of pressed metal parts in steel, brass, aluminum and other metals, recently held "open house" for its employees, members of their families and other friends. Employees acted as guides to visitors and Frank E. Graper, vice-president and general manager, served as master of ceremonies. A new 400-ton hydraulic press, enabling the company to process steel shells of larger diameter and depth than heretofore, was exhibited.

The Metal Goods Corp., St. Louis, has leased for 10 years the 3-story building, containing 60,000 sq. ft. of floor space at 5201-37 Brown Avenue, and will expend approximately $25,000 for alterations and improvements, including the installation of a steam heating plant. The corporation is distributer for the Aluminum Co. of America, the American Brass Co., the American Rolling Mill Co., the National Brass & Copper Co. and the M. & H. Zinc Co.

U. S. Needs "Moral Rearmament," J. C. Argetsinger Tells Industry

AMERICA must have a "moral rearmament" and its employers and employees must unite to prevent the growth of political tyranny, J. C. Argetsinger said in one of a series of addresses made by industrial leaders and economists before business executives of western Pennsylvania and northeastern Ohio.

Mr. Argetsinger, vice-president and general counsel for Youngstown Sheet & Tube Co., told business men meeting at Westminster College, New Wilmington, Pa., that "labor and capital can submerge their natural tendencies to selfishness and together can rewrite" the Wagner Act, the Wage and Hour laws, Internal Revenue legislation and the Social Security laws.

"They can demand and execute a cessation of waste and wasteful spending, coupled with a balanced budget and a pay-as-you-go plan," he declared. At the same time the Youngstown, Ohio, steel executive, pointing out that all of the opinions expressed were his own, warned that labor and capital "should not permit Government to influence their decisions by incentive taxation, consent decrees, Federal competition or Fascist control. Employers and employees, he continued, can study their own problems of social security, annual wages and profit-sharing programs.

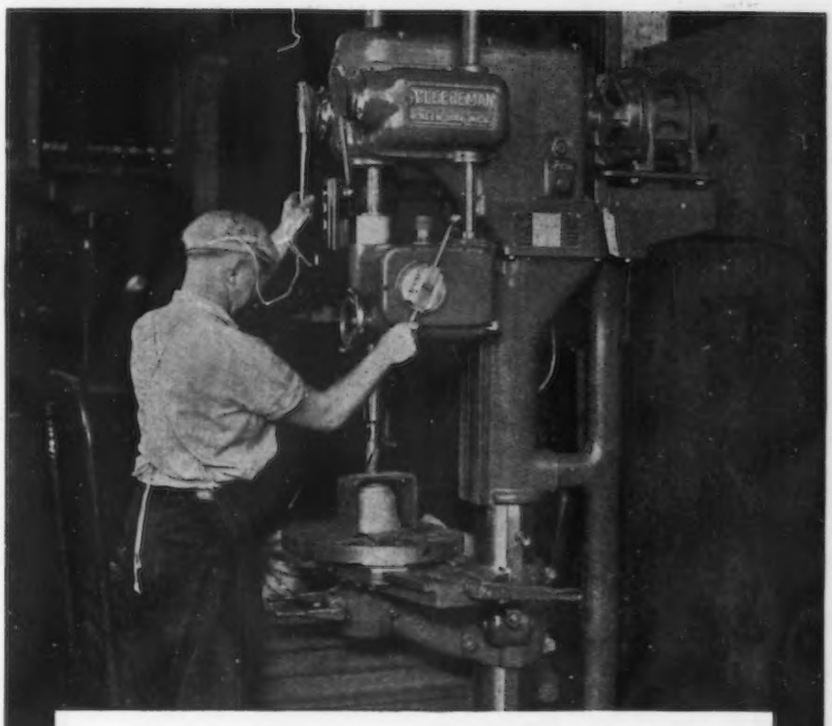
Government "Overwhelmed"

"Administrative government has overwhelmed us with its rapid spread in the last half decade but despite the complexity of our national life, our American people, whether in the ranks of labor or of capital, are not prepared to accept the regimentation and standardization which bureaucracy inevitably brings. The place of Government," Mr. Argetsinger added, "is not that of a dominant partner, dictating all the moves and submerging labor and capital with rules and regulations for every action; it is rather that of a benign friend, trusted counsellor and impartial advisor.

To solve these problems, capital and labor must, said the Youngstown steel executive, enlist the aid and sympathy of the consuming public and their political representatives. Labor is even more important in this enterprise than capital, he suggested, because labor has control of millions of votes and is more cohesive in its joint actions than any of the other groups.

Some of the responsibility for conditions growing up in the last few year was placed at the doors of the employers. "It seems to me fair criticism of industry and business to say that during the last eight years they have surrendered their prerogatives and have run away from a terror which was largely imaginary," the Sheet & Tube executive declared. "They have failed lamentably," he went on, "to cooperate with legislators in drafting new measures and they have failed equally in any attempt to reason with the opposition in writing legislation."

While industry has shirked its responsibilities it has, said Mr. Argetsinger, complained of the results. "It is time indeed," he added, "that business brings forth its best brains in a spirit of cooperation."



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Precision built for jig, fixture, tool and die work. Especially adapted to manufacturing where unusual accuracy is required. Also for experimental work and short run production. They handle drilling, boring, reaming, tapping and light milling.

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Round or square columns . . fully geared . . anti-friction . . automatic oiling . . single lever control for feed . . single lever control for speeds . . reversing motor, no friction clutches . . standard range, 21" to 30" sizes . . Capacity 1½" thru S.A.E. 1035 steel.

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Hopkins Continues To Toss Bouquets At Business Men

WASHINGTON—Prodded on by Administration grooming, Secretary of Commerce Harry L. Hopkins continued last week to throw bouquets in the direction of business while awaiting his speech scheduled for Feb. 24 in Des Moines, Iowa, where he will address the Des Moines Economic Club on "Government and Business."

Asked at a press conference what he thought of members of the Commerce Department's Business Advisory Council, who reportedly were "impressed with Hopkins' approach to the task" when they met with him two weeks ago, the new Secretary of Commerce said:

"I found them a very objective group of men who seem to me to be tremendously interested in what happens to this country and in working out a reasonable relationship between Government and industry—a group of men with a realistic understanding of the changes that have occurred in the economic world and anxious to work out something which, in the last analysis, means a great national income and a fair distribution of that income. That is the impression I got from these men."

Calls Profit Essential

Hopkins, who at his press conferences appears to weigh carefully every word before speaking, conceded that finding a solution to those problems is what he aims to do as Secretary of Commerce.

"Naturally," he added in elaboration, "anything I can do to help increase the national income I want to do. And I am fully aware that one of the important elements in achieving a rising national income is, among other things, fair and reasonable profits for business. That, together with all related matters become my concern as Secretary of Commerce."

The Secretary said he discussed with members of the Business Advisory Council the business of the Commerce Department; the "different kinds of things the secretary should be interested in to help industry—to help business men make money; the relationship of Government to industry in ways that fully protect the interest of all concerned."

He declined to answer other questions, insisting that, although he didn't want to appear secretive, the press would have to wait until his forthcoming speech to learn all the answers.

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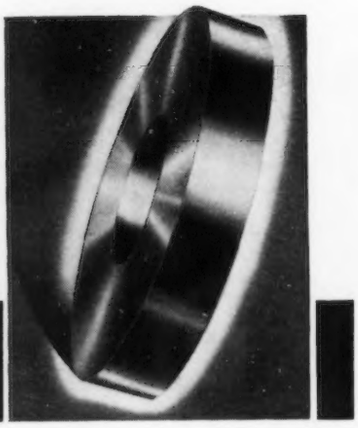
Bright Finish Uncoated · Electro Nickel Coated
Electro Copper Coated · Electro Zinc Coated
Electro Bronze Coated · Electro Brass Coated



THE THOMAS STEEL CO.
Specialized Producers of Cold Rolled Strip Steel
WARREN, OHIO

Kilby Car & Foundry Now Kilby Steel Co.

KILBY CAR & FOUNDRY CO., Anniston, Ala., manufacturer of high grade carbon and special alloy steels, has changed its name to the Kilby Steel Co. The business was established in 1889 by Thomas E. Kilby as the Smith & Kilby Co. and later became the Kilby Locomotive & Machine Works, then Kilby Car & Foundry Co. The new name change involves no revision in capital structure, ownership, officers or general set-up, the company announces.

Finished Steel Produced for Sale in 1938 Totaled 20,993,315 Tons

THE quarterly report of the American Iron and Steel Institute (AIS 10) showing the production for sale of finished iron and steel products for the fourth quarter and the entire year 1938 is reproduced on this page. The report shows a total production last year of 20,993,315 gross tons, including 1,925,103 tons sold to members of the industry for further conversion. The fourth quarter total was 6,961,157 tons, including 732,536 tons sold to members of the industry for further conversion. The fourth quarter production was 51.7 per cent of finishing capacity and the yearly total was 39.6 per cent of finishing capacity.

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

Fourth Quarter - 1938 (period)

		Number of companies	Items	Annual Capacity Gross tons	Production for Sale—Gross Tons: Current Quarter — Total	Per cent of capacity	Shipments: Export	Shipments: To members of the industry for conversion into further finished products	To Date (12 Months 1938) — Total	Per Cent of capacity	Shipments: Export	Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	29	1	xxxxxxx	620,840	xxx	24,722	412,044	1,708,067	xxx	141,716	1,030,546
	Heavy structural shapes	8	2	4,657,100	394,547	33.9	16,394	-	1,387,204	29.8	71,700	xxxxxxx
	Steel piling	3	3	234,500	37,655	64.2	3,239	-	114,764	48.9	6,025	xxxxxxx
	Plates—Sheared and Universal	20	4	5,992,710	451,510	30.1	43,268	2,981	1,457,588	24.3	130,448	7,380
	Skelp	6	5	xxxxxxx	133,329	xxx	39,497	52,561	394,977	xxx	55,066	216,125
	Rails—Standard (over 60 lbs.)	4	6	3,395,000	86,902	10.2	11,286	-	552,355	16.3	27,261	xxxxxxx
	Light (60 lbs. and under)	6	7	436,500	15,107	13.8	1,565	-	42,806	9.8	6,100	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	105,000	3,450	13.1	167	-	16,915	16.1	4,760	xxxxxxx
	Splice bar and tie plates	14	9	1,310,050	29,174	8.9	1,409	-	196,753	15.0	3,831	xxxxxxx
	Bars—Merchant	37	10	xxxxxxx	616,014	xxx	17,698	58,248	1,755,157	xxx	90,242	187,062
	Concrete reinforcing—New billet	15	11	xxxxxxx	182,062	xxx	13,056	-	623,769	xxx	39,186	xxxxxxx
	Rerolling	18	12	xxxxxxx	34,368	xxx	1,957	-	122,663	xxx	8,354	xxxxxxx
	Cold finished—Carbon	19	13	xxxxxxx	103,154	xxx	1,415	-	275,876	xxx	6,169	xxxxxxx
	Alloy—Hot rolled	14	14	xxxxxxx	156,259	xxx	4,684	10,639	357,354	xxx	13,485	33,660
	Cold finished	14	15	xxxxxxx	13,458	xxx	105	-	32,918	xxx	622	xxxxxxx
	Hoops and baling bands	5	16	xxxxxxx	11,430	xxx	259	-	51,789	xxx	1,408	xxxxxxx
	TOTAL BARS	55	17	11,547,859	1,116,745	38.7	39,174	68,887	3,219,526	27.9	159,466	220,722
	Tool steel bars (rolled and forged)	15	18	94,150	5,073	21.6	775	-	16,541	17.6	1,251	xxxxxxx
	Pipe and tube—B. W.	16	19	1,771,779	164,855	37.2	6,978	-	539,190	30.4	20,933	xxxxxxx
	L. W.	11	20	1,428,380	60,297	16.9	1,976	-	270,921	19.0	10,839	xxxxxxx
	Electric weld	4	21	614,000	30,678	20.0	1,069	-	132,929	21.6	9,640	xxxxxxx
	Seamless	15	22	2,942,900	323,982	44.0	14,859	-	1,111,923	37.8	73,269	xxxxxxx
	Conduit	7	23	158,720	10,112	25.5	172	-	38,371	24.2	1,383	xxxxxxx
	Mechanical Tubing	5	24	182,300	20,833	45.7	1,220	-	59,421	32.6	4,459	xxxxxxx
	Wire rods	19	25	xxxxxxx	151,669	xxx	2,921	52,288	412,316	xxx	22,410	148,959
	Wire—Drawn	38	26	1,967,370	263,417	53.6	17,088	2,800	811,936	41.3	52,110	9,244
	Nails and staples	19	27	1,078,572	127,597	47.3	9,044	-	437,613	40.6	27,169	xxxxxxx
	Barbed and twisted	16	28	425,477	28,979	27.2	12,618	-	130,349	30.6	35,630	xxxxxxx
	Woven wire fence	15	29	711,825	36,799	20.7	324	-	167,423	23.5	1,320	xxxxxxx
	Bale ties	11	30	110,677	5,888	21.3	42	-	37,323	33.7	296	xxxxxxx
	All other wire products	5	31	29,000	2,290	31.6	2	-	4,871	16.8	8	xxxxxxx
	Fence posts	14	32	147,100	8,329	22.6	101	-	40,957	27.8	926	xxxxxxx
	Black plate	12	33	503,015	60,743	48.3	1,675	24,670	262,589	52.2	7,281	92,282
	Tin plate—Hot rolled	11	34	1,631,956	118,392	29.0	16,855	-	603,344	37.0	136,612	xxxxxxx
	Cold reduced	10	35	1,828,100	255,892	56.0	19,771	-	841,582	46.0	69,790	xxxxxxx
	Sheets—Hot rolled		36	xxxxxxx	921,053	xxx	35,098	67,428	2,163,219	xxx	124,873	93,324
	Hot rolled annealed	25	37	xxxxxxx								
	Galvanized	16	38	xxxxxxx	272,426	xxx	24,349	-	889,387	xxx	83,137	xxxxxxx
	Cold rolled	19	39	xxxxxxx	525,966	xxx	36,151	-	1,199,844	xxx	97,822	xxxxxxx
	All other	15	40	xxxxxxx	92,899	xxx	4,362	-	254,965	xxx	13,580	xxxxxxx
	TOTAL SHEETS	26	41	10,504,353	1,812,344	69.0	99,960	67,428	4,507,415	42.9	319,412	93,324
	Strip—Hot rolled	25	42	3,223,200	383,762	47.6	7,754	48,877	934,227	29.0	33,613	106,541
	Cold rolled	37	43	1,178,961	159,870	54.2	3,219	-	382,856	32.5	10,504	xxxxxxx
	Wheels (car, rolled steel)	5	44	380,319	15,653	16.5	107	-	57,978	15.2	2,594	xxxxxxx
	Axles	5	45	425,900	10,800	10.1	2,808	-	40,515	9.5	10,045	xxxxxxx
	Track spikes	11	46	302,350	12,386	16.4	553	-	52,411	17.3	2,206	xxxxxxx
	All other	5	47	26,657	1,267	19.0	-	-	7,359	27.6	48	xxxxxxx
	TOTAL STEEL PRODUCTS	141	48	xxxxxxx	6,961,157	xxx	402,572	732,536	20,993,315	xxx	1,460,121	1,925,103
	Estimated total steel finishing capacity based on a yield from ingots of 70.6%	-	49	48,152,500	xxxxxxx	51.7	xxxxx	xxxxxxx	xxxxxxx	39.6	xxxxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	29	50	xxxxxxx	889,335	xxx	76,915	207,168	3,049,290	xxx	406,485	472,472
	Ingot moulds	4	51	xxxxxxx	78,843	xxx	2,530	-	176,926	xxx	6,930	xxxxxxx
Iron Products	Bars	12	52	230,519	5,755	10.0	6	238	16,951	7.4	317	320
	Pipe and tubes	4	53	185,457	7,318	15.8	150	-	26,394	14.2	524	xxxxxxx
	All other	2	54	63,560	1,481	9.3	101	240	6,797	10.7	407	2,184
	TOTAL IRON PRODUCTS (ITEMS 52 to 54)	14	55	421,576	14,554	13.8	257	478	50,142	11.9	1,248	2,504

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current quarter 6,228,621 *G.T.;* 51.7 *% of Finishing Capacity.*
To date 19,068,212 *G.T.;* 39.6 *% of Finishing Capacity.*
The above tonnages represent 70.6 *% of the ingots produced by companies whose products are included above.*

Total Companies included - 164

Imports (In Gross Tons)

	December		Twelve Months Ended December	
	1938	1937	1938	1937
Pig iron	1,237	9,128	33,088	111,697
Sponge iron	83	237	519	1,872
Ferromanganese[1]	4,333	399	21,125	23,965
Spiegeleisen	2,440	341	17,267	17,895
Ferrochrome[2]	21	....	121	260
Ferrosilicon[3]	251	57	930	2,924
Other ferroalloys[4]	25	....	43	52
Scrap	6,519	688	24,451	81,640
Pig iron, ferroalloys and scrap	*14,909*	*10,850*	*97,544*	*240,305*
Steel ingots, blooms, etc.	....	....	204	130
Billets, whether solid or hollow	37	223	551	2,077
Wire rods	480	634	5,280	15,818
Semi-finished steel	*517*	*857*	*6,035*	*18,025*
Concrete reinforcement bars	317	85	1,532	3,894
Hollow steel bars	48	191	864	2,538
Merchant steel bars	1,854	2,462	18,898	44,191
Iron slabs	....	....	....	1
Iron bars	20	93	505	1,959
Boiler and other plate (including skelp)	1	....	357	214
Sheets, skelp, and saw plate	34	258	6,045	8,800
Die blocks or blanks, etc.	3	1	96	102
Tin plate, taggers' tin and terne plate	7	15	108	248
Structural shapes	3,621	3,396	39,389	76,013
Sheet piling	....	99	235	2,260
Rails and track material	281	166	3,621	8,299
Welded pipe	515	748	5,882	9,540
Other pipe	1,729	2,136	23,223	32,947
Cotton ties	....	....	8,692	454
Other hoops and bands	2,143	1,878	17,439	26,697
Barbed wire	738	589	12,527	16,664
Round iron and steel wire	264	484	1,684	4,865
Telegraph and telephone wire	11	17	27	34
Flat wire and steel strips	295	262	2,692	4,033
Wire rope and strand	114	232	2,021	3,547
Other wire	73	65	1,459	3,247
Nails, tacks, and staples	677	432	7,600	15,031
Bolts, nuts, and rivets	5	9	212	571
Horse and mule shoes	24	....	428	397
Rolled and finished steel	*12,774*	*13,618*	*155,536*	*266,546*
Malleable iron pipe fittings	....	....	76	416
Cast iron pipe and fittings	171	39	1,544	3,282
Castings and forgings	396	428	3,816	4,586
Total	28,767	25,792	264,551	533,160

[1] Manganese content; [2] chrome content; [3] silicon content; [4] alloy content.

Exports (In Gross Tons)

	December		Twelve Months Ended December	
	1938	1937	1938	1937
Pig iron	20,622	36,545	432,851	782,436
Ferromanganese and spiegeleisen	3	39	244	1,725
Other ferroalloys	149	362	1,192	2,780
Scrap, iron and steel	321,261	319,016	2,979,006*	4,039,143
Scrap, tin plate	1,879	604	17,263*	27,188
Waste-waste tin plate	551	151	7,254	26,259
Pig iron, ferroalloys and scrap	*345,465*	*356,717*	*3,437,810*	*4,879,531*
Ingots, blooms, billets, sheet bars	10,197	64,183	159,930	331,490
Ingots, etc., alloy steel, incl. stainless	198	53	7,736	7,232
Skelp	7,439	624	59,686	76,478
Wire rods	307	2,811	22,283	60,006
Semi-finished steel	*18,141*	*67,671*	*249,635*	*475,206*
Bars, plain and reinforcing	11,264	17,448	141,780	150,414
Bars, alloy steel	2,393	585	7,932	6,398
Bars, stainless steel	117	29	669	223
Iron bars	37	65	1,354	2,221
Plates, plain and fabricated	20,373	25,535	220,508	406,840
Plates, alloy steel	58	66	3,034	5,054
Plates, stainless	17	10	277	148
Sheets, galvanized steel	7,279	5,863	72,269	75,440
Sheets, galvanized iron	229	752	3,691	5,542
Sheets, black, plain steel	23,428	20,749	200,213	280,061
Sheets, alloy steel	150	81	3,364	4,730
Sheets, stainless	60	298	1,681	1,440
Sheets, black iron	866	379	7,561	10,787
Hoops, bands, strips, plain steel	6,690	8,373	61,479	109,456
Hoops, bands, strip steel, alloy	55	43	450	1,140
Hoops, bands, strip steel, stainless	62	55	632	644
Tin plate and taggers' tin	10,578	31,364	157,069	354,339
Terne plate (including long ternes)	307	517	4,397	5,153
Structural shapes, plain material	5,733	8,060	83,217	135,706
Structural material, fabricated	2,825	3,742	38,937	40,844
Sheet piling	104	657	3,494	7,477
Tanks, steel	2,228	12,547	37,623	44,579
Steel rails	4,999	28,596	82,623	148,182
Rail fastenings, switches, spikes, etc.	801	2,341	12,823	21,260
Boiler tubes	368	1,062	12,229	17,459
Casing and oil line pipe	4,940	8,057	67,057	94,712
Pipe, black and galv., welded steel	3,168	2,900	25,396	39,817
Pipe, black and galv., welded iron	832	1,688	5,792	7,862
Plain and galvanized wire	4,607	3,183	49,863	56,100
Barbed wire and woven wire products	3,429	2,093	37,481	38,578
Wire rope and other products	1,141	1,141	10,634	16,561
Nails and tacks	2,902	2,141	25,965	21,906
Bolts, nuts, rivets and washers except track	749	744	8,057	11,165
Other finished steel	217	268	3,088	2,936
Rolled and finished steel	*123,006*	*191,432*	*1,392,639*	*2,125,174*
Cast iron pipe and fittings	2,124	2,378	31,894	31,177
Malleable iron screwed fittings	304	266	3,093	5,384
Carwheels and axles	579	6,351	20,919	27,777
Castings, iron and steel	505	684	6,459	11,829
Castings, alloy steel, incl. stainless	246	144	1,146	1,647
Forgings, plain	671	646	8,119	9,189
Forgings, alloy steel, incl. stainless	54	119	993	933
Castings and forgings	*4,483*	*10,588*	*72,623*	*87,936*
Total	490,095	626,408	5,152,707*	7,567,847

*Corrected totals, November figures revised.

1938 Imports Lowest in 17 Years—December Shipments Down

DECEMBER exports of iron and steel products (scrap excluded) at 166,404 gross tons were 29,752 tons below the November trade, according to figures issued by the Bureau of Foreign and Domestic Commerce.

Exports last year totaled 2,149,184 gross tons, compared with 3,475,257 tons in 1937, exceeded the total for any year since 1929 (save 1937), and were greater than the combined export trade of 1932, 1933 and 1934.

Although there was a decline in exports to Japan of from 879,652 tons in 1937 to only 484,879 tons in 1938, that country continued to be the largest single market for American iron and steel. Canada was second, taking 276,337 tons, followed by the United Kingdom, 132,618 tons. Shipments to the Netherlands rose sharply to 85,293 tons from her 1937 total of 51,131 tons.

At their lowest since 1921, imports of iron and steel in 1938 totaled only 240,100 gross tons, compared with 451,520 tons in 1937. Despite a decrease of 36,624 tons, structural shapes totaling 39,389 tons was the leading product in point of tonnage in the 1938 import trade. Receipts of pig iron suffered the sharpest reduction.

December Imports of Iron and Manganese Ores

(In Gross Tons)

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1938	1937	1938	1937
Canada	60	....	1	....
Cuba	21,000	22,000	9,318	5,306
Chile	139,800	119,685	....	....
Spain	....	....	....	....
Norway	14,034	21,203	....	....
Sweden	....	7,031	....	....
French Africa	....	....	....	....
Russia	....	....	9,797	18,064
India	....	....	537	523
Brazil	....	....	....	....
Gold Coast	....	....	10,143	14,022
Other countries	12,311	11,502	....	....
Total	187,205	181,421	29,796	37,915

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	December		Twelve Months End. December	
	1938	1937	1938	1937
United Kingdom	....	....	42	100
British India	297	6,460	12,411	69,621
Germany	....	....	....	510
Netherlands	150	2,502	14,236	28,772
Canada	790	166	2,656	6,638
France	....	....	....	....
Belgium	....	....	....	....
Norway	....	....	3,538	875
Sweden	....	....	205	600
Russia	....	....	....	4,581
Other countries	....	....	....	....
Total	1,237	9,128	33,088	111,697

CAST IRON PIPE

Treasury Department. Boston Procurement Office has awarded 3500 ft. of 6-in. pipe for Peabody, 11,000 ft. of 12-in. for Attleboro, and 17,000 ft. of 36-in. for Methuen to Warren Foundry & Pipe Corp.; 1200 ft. of 12-in. for Worcester to R. D. Wood & Co.; 2300 ft. of 16-in. for Pittsfield to Donaldson Iron Co.

Brockton, Mass., has awarded 1776 ft. of 30-in. pipe to Florence Pipe Foundry & Machine Co., Philadelphia.

Newton, Mass., has awarded 8000 ft. of 6-in. pipe and 10,000 ft. of 8-in. to Warren Foundry & Pipe Corp., Boston.

Bellingham, Mass., will close bids Feb. 11 on 82,000 ft. of 4 to 12-in. pipe, about 1000 tons. PWA is cooperating in financing the project.

Salem, Mass., has awarded 2588 ft. of 16-in. pipe, 260 ft. of 8-in. and 182 ft. of 6-in. to Florence Pipe Foundry & Machine Co., Philadelphia.

Kenmore, N. Y., plans pipe lines for water system and other waterworks installation, including reservoir, main trunk line, pumping station and filtration plant. Cost close to $675,000: Gascoigne & Associates, Leader Building, Cleveland, are consulting engineers.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 10 for 2400 lin. ft. of cast iron soil pipe (Schedule 3420).

Winchester, Va., plans main pipe line from proposed new water reservoir in northern part of city to connection with present mains. It is proposed to arrange bond issue of $53,000 for entire project.

Lakemore, Ohio, plans pipe lines for new municipal water system; also pumping station and other waterworks equipment. Cost about $117,000. Financing has been arranged.

Board of Public Works, Wauwatosa, Wis., asks bids until Feb. 17 for about 5500 lin. ft. of 12-in. and 5000 ft. of 6-in. for water system; also for seven 12-in. and 20 6-in. gate valves, fire hydrants, pipe fittings, etc. W. T. Whipp is secretary.

Wausau, Wis., has placed 3258 lin. ft. of 8-in. cast iron pipe with American Cast Iron Pipe Co. (WPA project.)

Central Board of Purchases, City Hall, Milwaukee, closes bids Feb. 23 for about 1425 tons of 6 to 16-in. cast iron water pipe, 10 tons of offset pipes, 85 tons of special castings, 700 valve boxes, 300 valve box parts, 70 gate valves 6 to 16-in., five steel standpipes, 75 fire hydrants and miscellaneous equipment.

Lansing, Iowa, plans about 4100 ft., various sizes, for extensions in water system. Financing for this and improvements in sewage system has been arranged through Federal aid.

Mount Ayr, Iowa, plans pipe line extensions and improvements in water system. Bond issue of $40,000 has been authorized for this and other waterworks construction. M. G. Hall, Centerville, Iowa, is consulting engineer.

Crocker, Mo., plans pipe line extensions and replacements in water system and other waterworks equipment. Cost about $130,000. Bond issue has been voted for part of financing.

Wichita, Kan., plans pipe line extensions in water system, including new trunk lines for water source now being developed from additional wells. Project will include 30 supply wells, with pipe line collecting system, storage reservoirs, pumping stations and other structures. Cost about $2,425,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Conway, Ark., plans pipe line extensions and improvements in water system. Fund of $140,000 has been arranged for this and other waterworks installation, of which $63,000 will be a Federal grant. M. Z. Bair is engineer.

Benavides, Tex., plans pipe lines for water system. Bond issue of $140,000 has been authorized for this and sewage system. Garrett Engineering Co., 308 Hughes Street, Houston, Tex., is consulting engineer.

Abilene, Tex., has authorized extensions in pipe lines, including main feeder line for water supply at Hendricks institution for children. Cost about $23,500. R. C. Hope is city engineer.

Daingerfield, Tex., plans early call for bids for pipe lines for water system and other waterworks installation; also for new sewage system. Charles Chappel, Pittsburg, Tex., is consulting engineer.

Moody, Tex., plans pipe lines for water system and other waterworks installation, including elevated steel tank and tower. Bond issue of $65,000 has been voted. Joseph J. Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Quinlan, Okla., plans pipe lines for water system and other waterworks installation. Bond issue to be arranged soon. Alexander & Pollard, Terminal Building, Oklahoma City, Okla., are consulting engineers.

Walsenburg, Colo., plans pipe line extensions in water system, including main feeder line from new filtration plant. Cost about $100,000, with filtration station. Financing has been arranged through Federal aid. Burton Lowther, Colorado Building, Denver, is consulting engineer.

Department of Water and Power, Los Angeles, has awarded 30,000 ft. of 8-in. and 10,000 ft. of 10-in. pipe to United States Pipe & Foundry Co., San Francisco; 50,000 ft. of 6-in. to National Cast Iron Pipe Co., Los Angeles, and 10,000 ft. of 4-in. and 20,000 ft. of 8-in. to American Cast Iron Pipe Co., Los Angeles.

Inglewood, Cal., has awarded 4028 ft. of 12-in., 4027 ft. of 10-in., and 180 ft. of 16-in. pipe to Southern Pipe & Casing Co., Azusa, Cal.

Wenatchee, Wash., will make extensions in pipe lines for water system, including replacements in several worn-out mains. Fund of $282,741 has been arranged for this and other waterworks installation, of which $206,925 will be secured through Federal aid.

. . . PIPE LINES . . .

General Gas Pipe Line Corp., Circle Tower Building, Indianapolis, plans new 20-in. welded steel pipe line from gas field area in Kentucky to connection with present main pipe line system in Indiana, about 180 miles, for natural gas transmission; also will build several branch lines at points along route for service in different municipalities. Cost over $1,000,000 with compressor and control stations, and other operating facilities. Right of way has been secured.

Breaux Bridge, La., has approved plans for pipe lines for municipal natural gas distribution, including welded steel pipe line for connection with supply source, control station and other operating facilities. Fund of $64,000 has been arranged.

Humble Pipe Line Co., Houston, Tex., an interest of Humble Oil & Refining Co., same place, is considering new welded steel pipe line from Kelsey oil field in Southeastern part of Jim Hogg County, Tex., to point near McAllen, Hidalgo County, Tex., about 60 miles, for crude oil transmission. Connection will be made at latter point with present pipe line system of company. Cost over $400,000 with booster stations and other operating facilities.

Burk Royalty Co., Bryson, Tex., plans extensions in steel pipe line gathering system in Jack County oil field, connecting 73 wells in that district, recently acquired. Work will include a welded steel pipe line from pumping station in oil field to connection with pumping plant of Texas Pipe Line Co. at Bryson, for crude oil transmission, from which point part of oil will be used by Burk company at its local refinery, and remainder transmitted through pipe line of Texas company to Burk refinery at Dallas, Tex.

San Antonio Public Service Co., San Antonio, Tex., plans extensions and replacements in gas pipe lines to provide for natural gas transmission instead of artificial gas, as heretofore, including welded steel pipe line for connection with supply source, control stations and other operating facilities. Cost over $300,000.

Beaumont Natural Gas Co., Beaumont, Tex., has let contract to Williams Brothers Corp., Second National Bank Building, Houston, Tex., for extensions and replacements in pipe lines. Beaumont company is operated by Glenn H. McCarthy, Inc., Sterling Building, Houston.

Commanding Officer, Erie Ordnance Depot, LaCarne, Ohio, asks bids until Feb. 16 for 720 lin. ft. of galvanized steel pipe (Circular 6).

Godfrey L. Cabot, Inc., Olean, N. Y., plans steel pipe line gathering system in connection with developments in Oriskany gas field in southern part of Steuben County, where several new wells will be drilled. Welded steel pipe line also is planned for connection with main natural gas line system, control stations and other operating facilities. Main offices of company are at 77 Franklin Street, Boston.

Sioux City Gas & Electric Co., Sioux City, Iowa, plans extensions and replacements in pipe line for gas distribution in different parts of city, in connection with 1939 expansion and improvement program. Fund of about $300,000 has been authorized for this and extensions in electric service lines. G. A. Neal is president and general manager.

Department of Public Safety, Harrisburg, Pa., has let contract to Columbia Foundation Co., Fourth and Courtland Streets, Philadelphia, for 42-in. coated steel pipe line from water source in Clarks Valley to city, about 2½ miles, at $138,391.

Caminol Oil Co. has obtained permission to build a 4-in. pipe line from Kettleman Hills to Hanford, Cal., about 35 miles.

U. S. Indian Irrigation Service, Los Angeles, has low bid from Western Pipe & Steel Co., San Francisco, at $28,965 for three 4-ft. diameter steel discharge pipe lines, each approximately 630 ft. long, including field welding for Flathead River pumping station, Flathead irrigation project, near Polson, Mont.

Water District No. 17, Seattle, care of Parker & Hill, Smith Tower Building, consulting engineers, plans 4 to 8-in. steel pipe for extensions and replacements in pipe lines. Alternate bids will be asked on cast iron and transite pipe. Pumping equipment also will be installed at Hunts Point station. Financing is being arranged.

. . . CANADA . . .

TORONTO, Feb. 7—Domestic buying is picking up steadily. While the automotive industry is starting to take larger shipments, it is not expected to reach peak volume for a month or six weeks. Prospective business is bright.

Announcement is made that the Quebec Government has authorized commencement of work on the new La Tuque hydro-electric power project to cost $15,000,000. This plant will be constructed by St. Maurice Power Corp., and work will be started next summer.

Steel Co. of Canada shareholders at annual meeting authorized directors to borrow through issue of bonds or debentures capital as required including that of $10,000,000 for a proposed continuous strip mill.

Pig iron sales are moved up steadily and melters are showing interest in the market.

January Daily Pig Iron Output Drops 1.5 Per Cent

PRODUCTION of coke pig iron in January on a daily basis dropped 1.5 per cent from that in December, or from 71,314 gross tons a day to 70,175 tons. Output for the month totaled 2,175,423 tons, compared with 2,210,728 tons in December. The rate of operation was at 51.5 per cent of the industry's capacity.

There were 118 furnaces in blast on Feb. 1, operating at the rate of 70,235 tons a day, compared with 117 furnaces on Jan. 1, producing at the rate of 71,315 tons daily. Six furnaces were blown in and five were blown out or banked. The United States Steel Corp. put three in operation and took the same number off blast. Independent producers blew in two furnaces and put out or banked the same number and merchant producers put one unit in operation.

Among the furnaces blown in were the following: One Clairton and one Edgar Thomson, Carnegie-Illinois Steel Corp.; one Lorain, National Tube Co.; one Susquehanna, National Steel Corp.; one Haselton, Republic Steel Corp.; and one Shenango Furnace Co. unit.

Furnaces blown out or banked included: One Ohio, one South Chicago (old) and one Gary Carnegie-Illinois Steel Corp.; the Trumbull-Cliffs and a River furnace of Republic Steel Corp.

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1939	1938	1939	1938
January	2,175,423	1,429,085	20,805	22,388
February	.....	1,298,268	....	20,205
March	.....	1,452,487	....	21,194
April	.....	1,376,141	....	18,607
May	.....	1,255,024	....	13,341
June	.....	1,062,021	....	14,546
½ year	.....	7,873,026	....	110,281
July	.....	1,201,785	....	20,818
August	.....	1,493,995	....	6,088
September	.....	1,680,435	....	630
October	.....	2,052,284	....	3,621
November	.....	2,269,983	....	13,156
December	.....	2,210,728	....	19,197
Year	.....	18,782,236	....	173,791

*These totals do not include charcoal pig iron.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1939	1938	1937	1936	1935
January	10,603	10,635	16,106	10,537	3,926
February	.....	8,854	16,514	11,296	6,288
March	.....	8,524	16,457	10,831	7,089
April	.....	8,273	14,517	13,897	8,799
May	.....	6,431	19,483	12,814	8,441
June	.....	5,375	15,870	14,209	7,874
July	.....	5,495	19,609	11,619	8,644
August	.....	6,614	17,831	12,148	8,194
September	.....	11,205	20,065	12,526	10,090
October	.....	10,799	18,950	13,645	11,199
November	.....	13,208	15,662	14,739	12,503
December	.....	9,130	10,964	14,852	13,312

Daily Average Production of Coke Pig Iron

Gross Tons

	1939	1938	1937	1936	1935
January	70,175	46,100	103,597	65,351	47,656
February	.....	46,367	107,115	62,886	57,448
March	.....	46,854	111,596	65,816	57,098
April	.....	45,871	113,055	80,125	55,449
May	.....	40,485	114,104	85,432	55,713
June	.....	35,400	103,584	86,208	51,570
½ year	.....	43,497	108,876	74,331	54,138
July	.....	38,767	112,866	83,686	49,041
August	.....	48,193	116,317	87,475	56,816
September	.....	56,015	113,679	91,010	59,216
October	.....	66,203	93,311	96,512	63,820
November	.....	75,666	66,891	98,246	68,864
December	.....	71,314	48,075	100,485	67,950
Year	.....	51,458	100,305	83,658	67,556

Production by Districts and Coke Furnaces in Blast

FURNACES	Production (Gross Tons) January (31 Days)	Production (Gross Tons) December (31 Days)	February 1 Number in Blast	February 1 Operating Rate, Tons a Day	January 1 Number in Blast	January 1 Operating Rate, Tons a Day
New York:						
Buffalo	156,457	139,515	9	5,045	8	4,500
Other New York and Mass.	6,649	8,324	1	215	1	270
Pennsylvania:						
Lehigh Valley	61,493	59,476	4	1,810	4	1,950
Schuylkill Valley	13,770	16,228	1	445	1	525
Susquehanna and Lebanon Valleys	13,856	14,154	1	445	1	455
Pittsburgh District	359,582	354,907	17	12,520	15	11,200
Ferro. and Spiegel	10,917	9,084	2	350	2	295
Shenango Valley	35,427	32,893	2	1,145	1	715
Western Pennsylvania	43,482	50,923	3	1,405	3	1,645
Ferro. and Spiegel	6,714	6,860	1	215	1	220
Maryland	109,622	117,221	4	3,535	4	3,605
Wheeling District	115,994	117,307	5	3,740	5	3,515
Ohio:						
Mahoning Valley	220,147	220,968	10	6,335	11	7,700
Central and Northern	192,464	211,770	11	6,800	11	6,470
Southern	45,048	38,419	5	1,455	5	1,340
Illinois and Indiana	402,321	431,698	17	12,470	19	14,625
Michigan and Minnesota	89,805	89,762	5	2,900	5	2,895
Colorado, Missouri and Utah	27,090	25,488	2	875	2	820
Ferromanganese	.....	.....	0	....	0	....
The South:						
Virginia	.....	.....	0	....	0	....
Ferromanganese	3,174	3,253	1	100	1	105
Kentucky	10,125	11,200	1	325	1	360
Alabama	251,286	251,278	16	8,105	16	8,105
Tennessee	.....	.....	0	....	0	....
Total	2,175,423	2,210,728	118	70,235	117	71,315

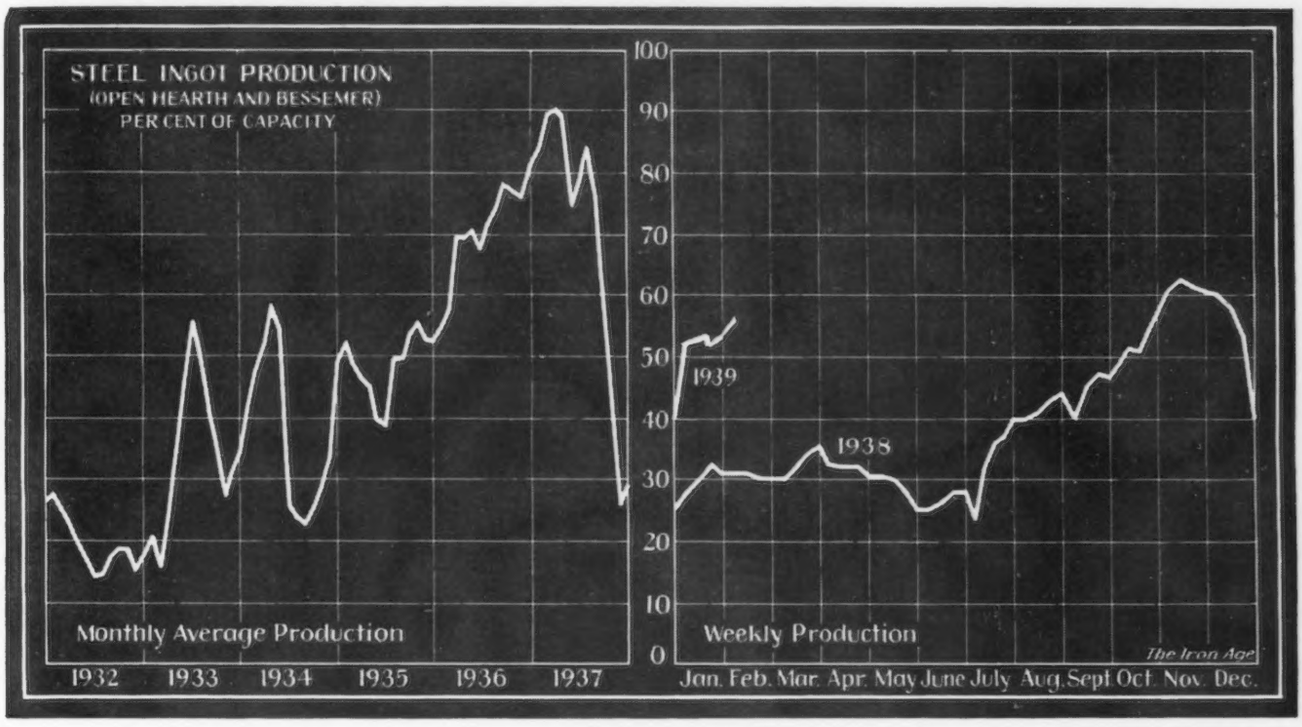
Bill, Linked to CIO, Requests U.S. to Take Over Steel Industry

WASHINGTON — Reportedly written at the request of the CIO, a bill providing for the acquisition, public ownership and Government operation of the iron and steel industry has been introduced in the House by Representative Usher L. Burdick, Republican of North Dakota.

Under the measure a 9-member iron and steel board would acquire the properties of the steel industry, and would control production and fix prices. The measure is substantially the same as the bill introduced last session by Congressman Teigan, Farmer-Laborite of Minnesota, who was not returned to the 76th Congress.

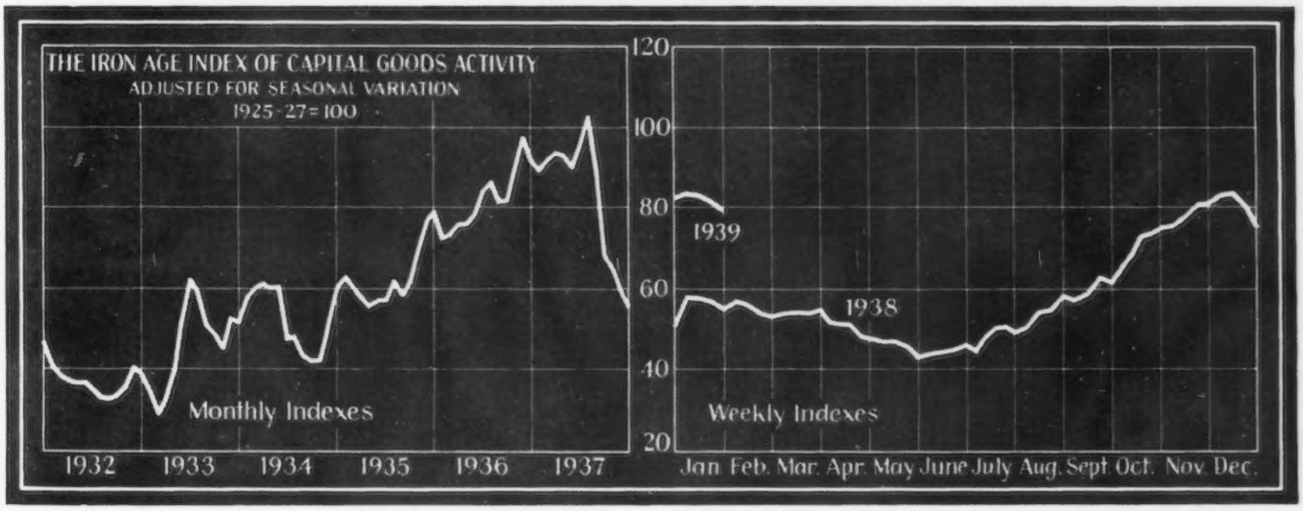
Representative Burdick has been in Congress since 1935 and was formerly a member of the North Dakota legislature and an assistant United States district attorney in that state.

Ingot Production Rises a Half Point to 54 Per Cent



		Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
District Ingot Production, Per Cent of Capacity	CURRENT WEEK..	47.0	51.0	49.0	37.0	59.0	79.0	36.0	93.0	68.0	43.0	60.0	61.0	60.0	**54.0**
	PREVIOUS WEEK..	47.0	48.5	47.0	35.0	61.0	79.0	46.5	87.5	68.0	53.0	60.0	60.0	60.0	**53.5**

Index Sinks to 79.3 as Output Slackens Further



THE slackening in the output of the heavy goods industries, first noted in the week of Jan. 28, was further accentuated in the past week with the result that THE IRON AGE index of capital goods activity declined 2.2 points to 79.3 for the week ended Feb. 4. This is the lowest index position since the holiday week of Dec. 31. The week's heaviest decline was recorded by the automobile series which dropped 10.9 points to 84.5 on the contra-seasonal decline of 9790 units in the week's assemblies. The Pittsburgh series was the one component of the index to move higher in the week. The gain in this component was due primarily to a higher rate of industrial activity in that district and an increase in freight shipments.

	Week Ended Feb. 4	Week Ended Jan. 28	Comparable Week 1938	Comparable Week 1929
Steel ingot production[1]	80.2	80.5	45.4	118.0
Automobile production[2]	84.5	95.4	63.2	143.9
Construction contracts[3]	103.8	104.7	65.9	119.8
Forest products carloadings[4]	56.9	57.5	55.4	133.2
Production and shipments, Pittsburgh District[5]	71.0	69.5	53.2	119.2
Combined index	**79.3**	**81.5**	**56.6**	**126.8**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record;* 4. Association of American Railroads; 5. University of Pittsburgh.

. . . SUMMARY OF THE WEEK . . .

. . . Rail tonnages outstanding; gains otherwise are small.

° ° °

. . . Pig iron production in January off 1½ per cent from December.

° ° °

. . . Steel prices steady as are also scrap quotations.

EXCEPTING rail tonnages, which continue to accumulate and which now have reached almost the total that was rolled last year, steel orders seem to be leveling off. Where there are any gains, they are small. Yet the general trend of steel business probably will be moderately upward during February and March, based on current prospects.

While the steel ingot production rate is up slightly this week to 54 per cent of the new capacity rating of 72,533,969 gross tons (not including castings), there have been sharp losses in some districts, indicating a mixed situation as to bookings of various products.

At Detroit, where the hand-to-mouth policies of the automobile industry seem to favor local consumption, the steel rate is 93 per cent, having been moved upward by higher production by the Ford Motor Co. In the South, where a good many rail tonnages have been placed recently, the mills continue at a fairly steady rate of 68 per cent. Sharp losses in production have occurred at Buffalo and in Southern Ohio, a lesser one at Cleveland, while moderate gains have been registered at Chicago, Youngstown and in Eastern Pennsylvania. The Pittsburgh district is unchanged.

THE January output of steel ingots totaled 3,186,834 gross tons, compared with 3,143,169 tons in December, but the January rate was only 52.69 per cent against 53 per cent in December owing to the use by the American Iron and Steel Institute of the new capacity rating in figuring the January percentage. However, last month's tonnage almost doubled that of January, 1938. Finished steel production for sale in 1938 was 20,993,315 gross tons, according to figures just compiled by the American Iron and Steel Institute.

Pig iron output in January was 2,175,423 gross tons, compared with 2,210,728 tons in December. The daily rate last month was 70,175 tons against 71,314 tons in December, a loss of 1½ per cent. The operating rate in the production of coke pig iron (excluding ferroalloys) in January was 51½ per cent, based on the American Iron and Steel Institute capacity rating of 49,252,120 gross tons, as of Dec. 31, 1938. On Feb. 1, there were 118 furnaces in blast operating at an average of 70,235 tons a day against 117 that were in blast on Jan. 1 and operating at an average of 71,315 tons a day. U. S. Steel subsidiaries put three furnaces out and three on, the independents two out and two on, the gain of one furnace being a merchant stack. The 118 furnaces in blast on Feb. 1 were only three less than on Dec. 1, which had the highest number reported during 1938.

OF the business placed during the past week, rail tonnages were the most striking. The Rock Island ordered 40,100 tons, the Missouri Pacific Lines 31,110 tons, the Delaware, Lackawanna & Western 6000 tons, and the U. S. Department of the Interior 3175 tons, the latter for relocation of Southern Pacific tracks around Shasta Dam.

Railroad equipment buying in prospect also promises support for the steel industry. The Missouri Pacific has been authorized by the Federal court to buy 1000 coal cars, seven diesel locomotives and two streamlined trains, the order for the trains having just been placed. The Missouri & Illinois, a subsidiary, is authorized to buy 125 box cars and 25 coal cars. Pending equipment business includes 1000 to 2000 freight cars and 15 locomotives for the Union Pacific, 40 locomotives for the Southern Pacific, 1000 cars for the Illinois Central and possibly 1000 cars for the Chicago & North Western, which may also buy a tonnage of rails. Much of this prospective business is tentative, however, with no assurance that it will be immediately closed. Some of the railroad equipment and supply manufacturers had in January the best month's business in a year and a half.

Four ships to be built by the Ingalls Shipbuilding Co., subsidiary of the Ingalls Iron Works Co., at Pascagoula, Miss., will take 17,480 tons of steel. The Columbia Steel Co. will furnish 10,000 tons of steel for two boats being built by the Moore Dry Dock Co., Oakland, Cal.

Fabricated structural steel lettings of only 8000 tons were the smallest since last July. Less than 12,000 tons of new work came into the market. Reinforcing steel awards were 10,500 tons.

MILL prices of steel products are steady. Some of the soft spots in resale markets are improving. Reinforcing bar prices throughout the country have been relatively firmer in recent weeks. New York jobbers are stiffening quotations on merchant pipe. Oil well tubing has been advanced by mills about $5 a ton.

Scrap prices are steady in the larger centers, but at St. Louis a sale of 10,000 tons brought a 50c. decline. THE IRON AGE scrap composite price is unchanged at $14.875.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Feb. 7, 1939	Jan. 31, 1939	Jan. 10, 1939	Feb. 8, *1938
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.80	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	32.0	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	Feb. 7, 1939	Jan. 31, 1939	Jan. 10, 1939	Feb. 10, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.00	$5.00	$5.00	†$5.35

*Pittsburgh prices only.
†Subject to post-season adjustment.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$22.84	$22.84	$22.84	$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.24
Ferromanganese, seab'd carlots	80.00	80.00	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$15.625	$15.625	$15.75	$14.25
Heavy melting steel, Phila.	15.25	15.25	15.25	14.75
Heavy melting steel, Ch'go.	13.75	13.75	13.75	12.75
Carwheels, Chicago	12.50	12.50	12.50	15.00
Carwheels, Philadelphia	16.75	16.75	16.75	15.25
No. 1 cast, Pittsburgh	15.50	15.50	15.50	16.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	15.75
No. 1 cast, Ch'go (net ton)	12.75	12.75	12.50	12.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Copper, electrolyic, Conn.	11.25	11.25	11.25	10.00
Copper, lake, New York	11.375	11.375	11.375	10.125
Tin (Straits), New York	45.75	46.45	46.75	40.50
Zinc, East St. Louis	4.50	4.50	4.50	4.75
Zinc, New York	4.89	4.89	4.89	5.10
Lead, St. Louis	4.70	4.70	4.70	4.60
Lead, New York	4.85	4.85	4.85	4.75
Antimony, Asiatic), N. Y.	14.00	14.00	14.00	15.625

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
February 7, 1939	2.286 a Lb.	$20.61 a Gross Ton	$14.875 a Gross Ton
One week ago	2.286	20.61	14.875
One month ago	2.286	20.61	14.92
One year ago	2.512c.	23.25	13.92

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on No. 1 heavy melting at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel — High	Finished Steel — Low	Pig Iron — High	Pig Iron — Low	Steel Scrap — High	Steel Scrap — Low
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	$15.00, Nov. 22	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . THIS WEEK'S MARKET NEWS . .

STEEL OPERATIONS

. . . Ingot rate slightly higher at 54% of capacity

THE IRON AGE estimates steel ingot production for this week at 54 per cent of the industry's capacity. The estimate of the American Iron and Steel Institute issued on Monday and based on the industry's new capacity rating was 53.4 per cent.

The average of THE IRON AGE weekly estimates in January was 52.46 per cent whereas the institute's report of actual production showed a rate of 52.69 per cent, based on the new capacity rating.

CHICAGO gained two and a half points this week to 51 per cent, the second consecutive weekly gain, while YOUNGSTOWN gained two points to 49 per cent and EASTERN PENNSYLVANIA is two points higher at 37 per cent. Percentagewise the greatest gain is at DETROIT, where the rate is now 93 per cent against 87½ per cent last week. Ford Motor Co. is now operating all but one open hearth, a small one of 100-ton rating, while Great Lakes Steel continues to operate 14 of its 16.

At PITTSBURGH, BIRMINGHAM and in the WHEELING-WEIRTON district operations are steady, but sharp losses have occurred in some other districts. The BUFFALO rate is off 10½ points to 36 per cent; the SOUTHERN OHIO rate is down 10 points to 43 per cent. The CLEVELAND rate is off two points, but this is due to the shutting down of an open hearth furnace for a few days. Flood warnings were partly responsible for the lower rate in SOUTHERN OHIO.

NEW BUSINESS

. . . Orders at fairly steady level but improvement comes slowly, if at all.

THE volume of new business at PITTSBURGH continues to move sidewise. Aggregate bookings in the past week are comparable with those of a few weeks ago. Producers look for things to move a little more rapidly during the latter part of this month.

CHICAGO steel circles, though not expectant of a decrease in orders, will be satisfied if business holds to present levels throughout the month. Little improvement is seen before March 1, when the seasonal spring improvement should be felt. Important buying from motor car makers is not looked for by CHICAGO mills until next month. The close relation of automobile assemblies to retail sales continues to result in hand-to-mouth buying from DETROIT and consequently from all that industry's many suppliers.

Rail orders from the Rock Island and the Missouri Pacific dominate the railroad picture this week. Car proposals still pending include 1000 cars for the Illinois Central and 1000 to 2000 for the Union Pacific, while the Chicago & North Western is understood to be considering 1000 cars and a sizable rail tonnage.

Bids were taken last week on the 5500 tons of steel in the third section of Chicago's subway; Michael Pontarelli, Chicago, was the low contractor. On Feb. 16 the fourth section will be opened. About 3700 tons of liner plates, 2750 tons of reinforcing and 450 tons of shapes will be required as well as miscellaneous tonnages of cast iron and steel conduit. The second section steel, totaling about 6000 tons, has not yet been awarded but disposition is expected this week.

Because inventories of finished goods are at the lowest point in many months, makers of farm equipment are anticipating increased production for some time as dealers stock up for the spring selling season. Raw material stocks are also quite low, which presages improved steel buying. Sales are running far behind a year ago, but the industry is moderately hopeful of crossing the comparative line during the present fiscal year. Improved bar sales in several CHICAGO offices, either directly or through cold drawers, can be traced to farm implement and tractor plants.

CLEVELAND and YOUNGSTOWN steel producers continue to be optimistic for the coming spring months, when national ingot production is expected to rise above 60 per cent. All indications point to a more active market, but not the run-away kind. The probable course of February business is still somewhat indefinite, depending upon the extent of buying by the larger consumers. Only a narrow spread exists between current production and present incoming tonnage, which consists of numerous and diversified orders which are individually small.

At CLEVELAND and YOUNGSTOWN the downward sales tendency of some products recently has been counterbalanced by improvement in other lines, such as merchant bars and tin plate. The average for the first quarter to date in both districts has held up well in comparison to the same length of time in the fourth quarter.

In general, consumer inventories continue quite low, but such has been the case for well over a year, and until general business conditions or advancing prices warrant stocking up, little of this kind of buying is expected.

Certain manufacturers of refrigerators and kindred equipment appear likely to step up production soon. Some foundry melting schedules have been increased by one day per week. A number of railroad equipment manufacturers during January enjoyed the best month of any during the past year and a half.

At BUFFALO a slump in operations has been brought about by two factors: The lack of substantial automotive orders and the fact that Eastern railroads whose requirements are turned out at BUFFALO have not bought very much steel.

In the SOUTH the market is fairly active and new business is being booked at a satisfactory rate. Railroad buying has given BIRMINGHAM mills fairly good backlogs.

On the PACIFIC COAST new construction projects, which have been active in that territory, have slowed down, but mills there have fairly good backlogs accumulated during the past few months.

Mixed results are reported in NEW YORK, where some companies are doing slightly better than in January, while others have experienced a moderate slump in orders the past week.

PRICES

. . . Mill prices steady . . . Some soft spots in resale markets firmer

BECAUSE of recently published reports of price weakness, the sales departments of steel companies have been especially alert during the past two weeks in an effort to determine whether there was any basis for such reports. Each of them has apparently determined to its own satisfaction that its competitors are holding to published quotations except, perhaps, in certain special cases that

are not indicative of the general market, such as large construction projects, where the price situation is largely governed by the action of secondary sellers.

Efforts are apparently being made to restore a better price situation in two branches of the secondary market that have long been weak spots, namely, in reinforcing bars and in the NEW YORK merchant pipe trade. The going prices on reinforcing bars have been relatively firmer throughout the country in the past few weeks. NEW YORK pipe jobbers have advanced their quotations. It is said that the extreme price is now 10 points off the established resale, whereas recently it had been as much as 20 and 22½ off.

The only formal price change is on oil well tubing, all classifications and grades, which has been marked up 5 per cent or about $5 a ton on the average. Mill prices of other tubular products are unchanged.

PIG IRON

. . . Shipments holding up fairly well but buying is light

THERE is very little new buying of pig iron in any of the markets, but shipments are holding up fairly well, particularly in the North Central States. Foundry stocks are said to be small, so that increases in the melt will be quickly reflected in larger shipments.

Foundries catering to or a part of the following lines of industry appear to be the most active: Automotive, farm implements, stoves, sanitary ware and machine tools.

There are some incompleted contracts carried over from last year against which users are still specifying, making it unnecessary for them to consider new purchases.

Prices are said to be holding firm on the moderate amount of new buying that is being done.

PLATES

. . . General run of buying is small . . . Eastern mills have light schedules

ALTHOUGH a fairly good number of projects requiring plates have recently appeared in the market, such as ships, cars, locomotives and construction work, the tonnage that is reaching the mills for immediate rolling is small. Some of the larger tonnages required for shipbuilding and for construction work call for deferred deliveries and therefore are of little help in the present situation.

In EASTERN PENNSYLVANIA the volume of demand has fallen to such a low point that mills are finding it difficult to maintain current poor operating rates. Miscellaneous plate demands are negligible, but eastern shipyards have supplied enough orders to round out rolling schedules for some EASTERN PENNSYLVANIA mills. In addition, the Reading Railroad is asking for delivery on about 500 tons of plates, which will be handled by a PHILADELPHIA fabricating shop.

Steel for the cargo ships being built for the Maritime Commission by the Moore Dry Dock Co., Oakland, Cal., will be furnished by the Columbia Steel Co., SAN FRANCISCO. About 6000 tons of plates and 4000 tons of shapes will be required.

At CLEVELAND and YOUNGSTOWN demand for plates has been only fair recently.

Market Sidelights

Seaboard Steel Products Corp., New York, has been awarded the contract for supplying 2-in. metal lath plaster partition and 2½-in. steel bases for the Queensbridge housing project in Queens, N. Y. Approximately 1600 tons of metal lath and small shapes will be required. The contract was awarded by William P. Scully Co., New York, lathing contractors on the project. Goldsmith Metal Lath Co., Cincinnati, will fabricate the partitions and bases. Details of the steel requirements are as follows: 700 miles of ¾-in. channels; 100 acres of metal lath; 200 miles of 18 gage 6-in. wide strip for the bases and ceiling strip, and 100,000 corner sections of 18 gage galvanized stock. This contract is believed to be the largest of its kind ever placed and will take the Goldsmith company seven months to complete.

* * *

Cleveland reports refrigerator production shows signs of marked improvement, with one Middle Western manufacturer planning to step up production to 8000 units per week against only 3000 per week recently.

* * *

Orders for 60 buses aggregating $485,000 were reported closed Feb. 4, by Twin Coach Co., Kent, Ohio.

* * *

Ground was broken this week for Chicago's largest apartment project in 13 years, the Marine Drive Apartments. Completion is expected in the fall of this year, after an expenditure of $1,500,000. The concrete fireproof structure, which will contain 202 four and five room apartments, will require about 800 tons of reinforcing steel.

SEMI-FINISHED STEEL

. . . Non-integrated mills are buying cautiously

LITTLE or no change in the volume of semi-finished steel bookings at PITTSBURGH has been noted during the past week. Current orders represent only absolute requirements, with most buyers still exhibiting a cautious attitude until some semblance of spring trend is discernible. Meanwhile, consumers' stocks are at a low point and any marked improvement in the general business picture should be rapidly reflected on mill order books.

Until business improves for non-integrated producers, sellers of semi-finished at CLEVELAND and YOUNGSTOWN do not expect a heavy movement of sheet bars, billets or other items. Demand from some of the small consumers outside the steel industry has been a little better than expected.

STRUCTURAL STEEL

. . . Lettings slump; Denver building to Texas firm

AWARDS dropped off sharply this week, although inquiries were more numerous at some points. Fifteen hundred tons for a Federal detention building at Denver, Colo., went to Southern Ornamental Iron Co., Arlington, Tex.

At most points structural lettings are light and fabricators' backlogs are diminishing. At CLEVELAND, bids are due Feb. 24 on another section of the Main Street bridge approach, involving 1600 tons, and a number of other bridges in northern Ohio will be out for bids in March. Bids will be taken Feb. 16 on 450 tons for the fourth section of the CHICAGO subway and a heating plant at Chanute field will require 600 tons. In the ST. LOUIS area the largest pending project is a market and terminal building in Kansas City, Kan., requiring 1350 tons. PITTSBURGH reports weekly tonnages are likely to fluctuate considerably over the next few months with a large amount of work pending. A BUFFALO civic building will take 2000 tons of shapes.

RAILROAD BUYING

. . . Large rail orders placed by Rock Island and Missouri Pacific

THE Chicago, Rock Island & Pacific and the Missouri Pacific Lines have contributed the largest rail orders of the week. The Rock Island bought 40,100 tons, allocated as follows: 27,400 tons to Carnegie-Illinois Steel Corp., 8000 tons to Inland Steel Co. and 4700 tons to Colorado Fuel & Iron Corp.

The Missouri Pacific Lines have ordered 31,110 tons, which have been distributed to the Inland Steel Co., Carnegie-Illinois Steel Corp., Tennessee Coal, Iron & Railroad Co. and Colorado Fuel & Iron Corp. The purchase covers 23,870 tons of 112-lb., 710 tons of 131-lb. and 6530 tons of 90-lb., all for Missouri Pacific except 2250 tons of 90-lb. for Gulf Coast Lines.

The Delaware, Lackawanna & Western has bought 6000 tons of rails, of which 5000 tons is to be furnished by Bethlehem Steel Co. and 1000 tons by Carnegie-Illinois.

Contracts totaling $223,340 for rails and track material for the relocation of Southern Pacific Railroad around Shasta Dam, Central Valley project, Cal., have been awarded by the Department of Interior to these companies: The Tennessee Coal, Iron & Railroad Co., which submitted the low bid for 3175 tons of open-hearth carbon rails to cost $162,702; Colorado Fuel & Iron Corp., which submitted a low bid for steel tie plates to cost $28,105; and a $15,480 contract for steel angle bars and compromise joints; and the Pettibone Mulliken Corp., Chicago, which will supply covered split switches to cost $17,051. The new line, which involves the relocation of approximately 37 miles of the Southern Pacific's main line railroad, will require 12 tunnels and eight major bridges.

The Missouri Pacific has been authorized by the Federal Court at St. Louis to purchase during 1939 the following equipment: 1000 50-ton, low-side, flat-bottom coal cars, $2,700,000; two 900 hp. diesel road locomotives, $198,000; three 900 hp. diesel switching locomotives, $255,000; two 600 hp. diesel switching locomotives, $126,000, and two streamlined trains, $1,344,000, a total of $4,623,000. The trustee also was authorized to buy for the Missouri & Illinois Railroad, a subsidiary, 125 50-ton box cars, $362,500, and 25 50-ton coal cars, $67,500, a total of $430,000. The road has ordered two diesel powered streamlined trains. Delivery is expected in six to eight months.

The Delaware, Lackawanna & Western is inquiring for six all-steel passenger coaches.

The Mexican Government Railways have placed an order for two oil-electric locomotives with General Electric Co.

Domestic railroad equipment manufacturers received orders in January for eight diesel-electric locomotives, three freight cars and 47 passenger-train cars, according to *Railway Age*. These compare with nine locomotives and 25 freight cars ordered in January, 1938.

BOLTS, NUTS, RIVETS

. . . Business holding up better than expected

CLEVELAND reports that bolt and nut business is holding up better than expected, not only in that immediate vicinity, but elsewhere throughout the country, particularly in the EAST, where great diversity of orders is shown. Only a few deviations from the price schedule are reported. Cap and set screw manufacturers expect February volume may be off a little from January, and likewise report the price situation firm except in the case of one or two producers.

REINFORCING BARS

. . . Awards taper but producers look for spring upturn

CONTRACTS let the past week increased in number but declined in tonnage involved. Nearly 4000 additional tons for the Lake Washington Bridge at Seattle has been placed, 2350 tons with Bethlehem Steel Co. and the remainder with Seattle Steel Co. Approximately 1000 tons for Federal penitentiary buildings at Denver has gone to Colorado Builders Supply Co.

Elsewhere, tonnages awarded are extremely light. Bethlehem Steel Co. took 475 tons for a concrete arch dam at Little Falls, N. J. Few awards have been announced in the past week at CHICAGO, where bids on 2750 tons of reinforcing bars for the fourth section of the Chicago subway are due Feb. 16. In the mid-west and at PITTSBURGH, where specifications are holding at recent levels, a satisfactory volume of business is anticipated during the coming months. Meanwhile, closing of requirements of several projects have wiped out most of the backlogs of NEW YORK sellers. Many small Government projects are hanging fire at ST. LOUIS. Eight thousand tons for Unit 4 of the Lake Washington bridge are still outstanding. A strike in the SAN FRANCISCO bay has put a considerable dent in jobbers' business there.

WIRE PRODUCTS

. . . Business is fair but not up to hopes

MERCHANT wire sales continue to hold most of the gains experienced at PITTSBURGH a few weeks ago. Although the current level of bookings is not satisfactory from a tonnage standpoint, there are indications of further improved demand in the near future. Manufacturers' wire requirements are holding up fairly well, despite the absence of major support from the automotive industry. Mill prices on wire products remain firm.

CLEVELAND producers report the sales tendency is downward at present, although the average for the first quarter still is comparable to the volume in the corresponding period of the fourth quarter. Occasional reports of price concessions are heard on manufacturers' wire and rods, but generally these turn out to be less serious than indicated. The quantity allowance on manufacturers' wire continues to be loosely handled in some areas.

No great increase in demand, either in merchant or manufacturing wire products, is looked for in the CHICAGO district until the end of February, at which time farmers should be able to get around for repairs, new equipment will be acquired and the spring motor car spurt will have started.

Manufacturers' wire is being specified in good volume in the EAST, with January bookings about equal to those of December. Prices are firm. Along the Atlantic Seaboard prices of fabricated wire, particularly the so-called hardware items such as wire cloth and poultry netting, are weak. Little chance of stability to this market is seen until after spring buying is completed. Wire nails, on the other hand, are exhibiting some signs of strength in prices, both in the primary and secondary markets.

In PHILADELPHIA some consumers have liquidated stocks obtained during December, and have come into the market for a moderate supply of re-

placement material. Buying in any real volume, however, is not looked for until early March. All recent transactions indicate fairly steady prices on wire and nails, but additional business is necessary to fully test the market.

TUBULAR GOODS

. . . Oil well tubing advanced $5 a ton . . . New York resale market firmer

ALL grades and classifications of oil well tubing have been advanced 5 per cent, effective Feb. 1. This advance will average about $5 a ton.

Efforts are being made also to strengthen the resale market in New York, which for some time has been one of the sore spots of the pipe trade. Recently New York distributers were selling at as much as 20 and 2½ off the established resale prices, but the extreme discount now is said to be 10 points.

Incoming specifications at pipe mills are holding at about the level of January.

SHEETS AND STRIP

. . . Demand taper; automobile buying now expected around March 1

DEMAND appears to be leveling off at some points with predictions of substantial buying from automobile manufacturers now centering around March 1. Miscellaneous consumers continue on the sidelines except for absolute necessities and producers are eating into backlogs.

From the present volume of ordering in the NEW YORK area, it is apparent that no large inventories of low-priced material shipped the latter part of December exist there. Reordering by refrigerator makers is heavy in some areas, light in others. One large producer reports that cold rolled sheets are available in four weeks, with other grades of steel, including tin mill products, available for delivery in less time. Some sellers are talking of a tighter delivery situation by early March. Bookings have eased at PHILADELPHIA, and have lightened at such points as PITTSBURGH, CLEVELAND and ST. LOUIS. In SOUTHERN OHIO, buying by household equipment manufacturers is reported lagging and automobile and miscellaneous users are slightly more active. Farm equipment makers are taking some tonnage at CHICAGO.

MERCHANT BARS

. . . No marked improvement noted in orders

THE current rate of orders at PITTSBURGH has changed but little in the past several weeks. No marked improvement is anticipated until those industries which gain impetus from seasonal factors expand their requirements. Some major support is anticipated later this month and early March from the automobile industry.

Incoming tonnage at CLEVELAND reflects gradual improvement. Individual orders are small, but represent a wide cross-section of buyers, including a smattering of implement, machinery and automotive business. Railroad equipment has also been an active field.

Farm equipment makers and tractor plants continue the greatest contributors to total bar bookings in the CHICAGO area. Until motor car production increases, no great increase in bar demand is expected at CHICAGO.

SHIPBUILDING

. . . Ingalls to build four ships, taking 17,480 tons steel

INGALLS SHIPBUILDING CORP., a subsidiary of the Ingalls Iron Works Co., BIRMINGHAM, has been awarded a contract by the Maritime Commission to build four C-3 cargo ships, at a cost of approximately $10,400,000. The boats will be built at Pascagoula, Miss., where Ingalls is erecting a new plant. Most of the steel will be furnished by BIRMINGHAM mills. The ships will require 17,480 tons of steel.

TIN PLATE

. . . Mild increase in orders pushes operations to 48%

A MILD but general increase in both general line can and sanitary can makers' demand is becoming apparent, but no strong forward movement is expected much before March. Operations this week are estimated at approximately 48 per cent, up three points from last week.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 100 tons of ferromanganese from Czechoslovakia; 130 tons of sponge iron, three tons of bar iron, nine tons of wire rods, 53 tons of steel tubes and 17 tons of steel bars from Sweden; 80 tons of steel bars, 57 tons of steel bands and 54 tons of structural shapes from Belgium.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Feb. 7, 1939	Jan. 31, 1939	Jan. 10, 1938	Feb. 8, 1938	1939	1938
Fabricated structural steel awards	8,000	22,450	19,600	5,950	134,500	75,150
Fabricated plate awards	1,150	10,755	6,900	875	25,425	15,190
Steel sheet piling awards	3,400	850	215	580	7,960	2,395
Reinforcing bar awards	10,550	21,515	10,250	3,765	73,970	27,280
Total Letting of Construction Steel..	23,100	55,570	36,965	11,170	237,705	120,015

FABRICATED STEEL

. . . Structural steel lettings are in small volume at 8000 tons as against 22,450 tons last week . . . New projects decline to 11,700 tons from 13,500 tons a week ago . . . Plate awards total 1150 tons.

NORTH ATLANTIC STATES
AWARDS

900 Tons, Absecon, N. J., grade crossing elimination for Pennsylvania-Reading Seashore Lines Co., to Bethlehem Steel Co., Bethlehem, Pa.

500 Tons, New Brighton, N. Y., warehouse for U. S. Gypsum Co., to American Bridge Co., Pittsburgh; through Turner Construction Co., New York.

300 Tons, Clifton, N. J., underpass, to Lehigh Structural Steel Co., Allentown, Pa.; through Union Building & Construction Co.

300 Tons, Cummington, Mass., State bridge C-21-2, to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, New York, Billy Rose swimming pool, World's Fair, to an unnamed bidder.

160 Tons, Queens, N. Y., Cross Island Parkway, to American Bridge Co., Pittsburgh.

145 Tons, Jamaica, N. Y., library, 89-14 Parsons Boulevard, to American Bridge Co., Pittsburgh.

140 Tons, Pittsburgh, nurses' home for Elizabeth Steel Magee Hospital, to Levinson Steel Co., Pittsburgh.

130 Tons, Utica, N. Y., shop building No. 44, State hospital, to Utica Steam Engine & Boiler Co., Utica, N. Y.

116 Tons, Fitchburg, Mass., State beam bridge, to Bethlehem Steel Co., Bethlehem, Pa.

100 Tons, State of Vermont, bridge, to American Bridge Co., Pittsburgh.

THE SOUTH

765 Tons, Sheffield, Ala., Electro Metallurgical Co. furnace building, to Virginia Bridge Co., Roanoke, Va.

190 Tons, Raceland, La., Godehaux Mills, section No. 1, to Ingalls Iron Works Co., Birmingham.

130 Tons, Tuscaloosa, Ala., Kress store, to Ingalls Iron Works Co., Birmingham.

CENTRAL STATES

470 Tons, Inner Grove, Minn., repairs, Mississippi River bridge, to American Bridge Co., Pittsburgh.

450 Tons, Cleveland, addition to grandstand at North Randall, to Truscon Steel Co.

175 Tons, Wyandotte, Mich., municipal power house addition, to Whitehead & Kales Co., Detroit.

165 Tons, Duluth, Minn., repairs to Garfield Avenue viaduct bridge, to American Bridge Co., Pittsburgh.

160 Tons, Mount Clemens, Mich., State bridge, to R. C. Mahon Co., Detroit.

145 Tons, Toledo, Ohio, housing project, to Toledo Shipbuilding Co., Toledo; through A. Bentley & Sons Co.

140 Tons, Athens, Ohio, school buildings, to Bethlehem Steel Co., Bethlehem, Pa.

130 Tons, Owosso, Mich., State bridge, to Fort Pitt Bridge Works Co., Pittsburgh.

130 Tons, Rockford, Ill., junior high school, to Mississippi Valley Structural Steel Co., St. Louis.

WESTERN STATES

1500 Tons, Denver, Federal detention buildings, to Southern Ornamental Iron Co., Arlington, Tex.; through Thomas Bates & Sons, Denver, contractor.

385 Tons, Salt Lake City, Utah, field house for University, to Minneapolis-Moline Power Implement Co., Minneapolis.

375 Tons, Graybull, Wyo., bridge, to Kansas City Structural Steel Co., Kansas City, Kan.; Ed Selander, general contractor.

127 Tons, Bent County, Colo., bridge, to Minneapolis-Moline Power Implement Co., Minneapolis.

PENDING STRUCTURAL PROJECTS
NORTH ATLANTIC STATES

2000 Tons, Buffalo, civic building.

600 Tons, Buffalo, school No. 18.

500 Tons, Clifton, N. J., five highway bridges; bids Feb. 24.

300 Tons, Brooklyn, garage for United States Treasury Department.

245 Tons, Ossining, N. Y., Park School.

200 Tons, Bradford, Vt., State bridge.

175 Tons, Cortland, N. Y., school building.

150 Tons, Dover, Vt., State bridge.

140 Tons, Baltimore, storage warehouse for International Harvester Co.

140 Tons, Lewistown, Pa., building for American Viscose Corp.

125 Tons, Barre, Vt., municipal auditorium.

THE SOUTH

135 Tons, Roanoke, Va., building for American Viscose Corp.

CENTRAL STATES

1600 Tons, Cleveland, East approach to Main Street bridge; bids Feb. 24.

1350 Tons, Kansas City, Kans., market and terminal.

600 Tons, Kansas City, Mo., manufacturing buildings for Agar Mfg. Corp.

600 Tons, Rantoul, Ill., heating plant, Chanute Field; bids Feb. 28.

450 Tons, Chicago, fourth section subway; bids Feb. 16.

350 Tons, Cleveland, supports for Big Creek intercepting sewer; bids Feb. 9.

175 Tons, Massillon, Ohio, Washington High School.

150 Tons, Minneapolis, addition for *Minneapolis Star.*

125 Tons, Chicago, Procter & Gamble, storage building; bids Feb. 13.

Unstated Tonnage, Cleveland, addition to post office.

WESTERN STATES

500 Tons, Colorado Springs, high school; bids Feb. 11.

400 Tons, Alameda, Cal., Navy shop superstructure; George A. Fuller Co., Los Angeles, low bidder on general contract.

325 Tons, Denver, food terminal for Union Pacific Railroad.

235 Tons, Hawthorne, Nev., ammunition depot, Bureau of Yards and Docks; bids in.

125 Tons, Sebastopol, Cal., H-columns for bridge; bids Feb. 15.

FABRICATED PLATES
AWARDS

490 Tons, Ashland, Ky., barges for Ashland Oil Refining Co., to Nashville Bridge Co., Nashville, Tenn., and Ingalls Iron Works Co., Birmingham.

310 Tons, Morganton, N. C., standpipe, to Ingalls Iron Works, Birmingham.

200 Tons, New York, Billy Rose swimming pool at World's Fair, to an unnamed bidder.

150 Tons, Calexico, Cal., gates for Bureau of Reclamation, to an unnamed bidder.

PENDING PROJECTS

500 Tons, Sacramento, Cal., Central Valley project for Bureau of Reclamation, Denver.

175 Tons, Cleveland, Big Creek intercepting sewer; bids Feb. 9.

SHEET PILING
AWARDS

2300 Tons, Jamestown, R. I., sheet piling and H-beams, bridge over Narragansett Bay, to Bethlehem Steel Co., Bethlehem, Pa., through Merritt-Chapman & Scott, Corp., New York.

600 Tons, New York, East River drive, to Bethlehem Steel Co., Bethlehem, Pa.; through Allen N. Spooner & Son, Inc., New York.

500 Tons, Cleveland, cut No. 5-A Cuyahoga River, to Bethlehem Steel Co., Bethlehem, Pa.; through L. A. Wells Construction Co., Cleveland.

PENDING PROJECTS

1135 Tons, Fort Peck, Mont., United States Engineer; bids in.

. GREAT BRITAIN .

. . . Domestic demand increasing slowly, export trade dull.

LONDON, Feb. 7 (*By Cable*)—British iron and steel demand is improving only slowly, though producers are now more hopeful of the political outlook. More steel furnaces have been started, but pig iron output has been restricted by the increasing use of scrap. Tees shipments totaled in January 5000 tons less than in December, which was the lowest since August. The export pig iron market is virtually stagnant.

Semi-finished steel output is increasing on air raid shelter demand, but heavy steel is quiet with an acute shortage of ship steel and rail orders. The export steel market is dull.

Continental steel demand is still quiet, but improvement is expected within the next few weeks as political tension eases. Potential demand is considered strong. American competition is reported still severe, especially in ship plates for Holland and Sweden.

Norway is planning iron and steel output expansion, consideration now being given the question of the erection of steel works at the mouth of the Glommen and rolling mills at Sjursoya.

There is an improved demand for Welsh tin plate with sales now in excess of production. Unfilled orders are a trifle under 2,500,000 base boxes. Owing to the fact that Wales is still in excess of her quota, export permits for prompt, early shipment are restricted; otherwise export sales would be larger.

Home demand is good especially in wasters. Commercial demand for galvanized sheets is poor, but makers are busy on Government orders and are assured of at least three months' full activity.

U. S. Steel Moves Washington Office

THE Washington office of United States Steel Corp. has been moved to suite 709-718 of the Normandy building, 1626 K Street NW.

. . . NON-FERROUS . . .

. . . Utility peace encourages copper, lead market . . . Week's spelter sales top 5000 tons . . . January lead shipments estimated at 43,000 tons.

NEW YORK, Feb. 7—News of the settlement of the TVA-utility problem to the satisfaction of both parties reopened the possibilities of large copper and lead purchases by the power companies in accordance with the rehabilitation program announced earlier in the year. While the trade is not anticipating any immediate support for the market from this source, the presence of a favorable factor in the future outlook after weeks of depressing developments gave rise to a much more optimistic sentiment among both buyers and sellers. The week's sales of copper, however, did not reflect this better feeling. The total for the month through Saturday of 2600 tons, indicates a daily average of only 430 tons. The past week brought a decided improvement in prices in the open market. On Monday sales were made at 10.625c. a lb., as compared with about 10.30c. a week ago. Domestic producers' prices, however, remain unchanged at 11.25c. per lb., Connecticut Valley. Sales abroad were in fair volume all week with prices little changed from the previous week.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Feb. 1	Feb. 2	Feb. 3	Feb. 4	Feb. 6	Feb. 7
Copper, Electrolytic[1]	11.25	11.25	11.25	11.25	11.25	11.25
Copper, Lake	11.375	11.375	11.375	11.375	11.375	11.375
Tin, Straits, New York	46.375	46.00	45.875	....	46.00	45.75
Zinc, East St. Louis[2]	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis[3]	4.70	4.70	4.70	4.70	4.70	4.70

[1] Delivered Conn. Valley, deduct ¼c. for New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

	New York	Cleveland
Tin, Straits pig	47.00c.	49.50c.
Copper, Lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.31c.	17.31c.
*Seamless brass tubes	20.06c.	20.06c.
*Seamless copper tubes	19.875c.	19.875c.
*Brass rods	12.62c.	12.62c.
Zinc slabs	6.25c.	7.00c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.75c.	5.60c.
Lead, bar	6.275c.	8.60c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.75c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	28.575c.	29.875c.
Babbitt metal, commercial grade	22.70c.	21.70c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.00c.	8.75c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.25c.	6.50c.
Brass, heavy	4.25c.	4.75c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.125c.	4.625c.
No. 1 red brass or compos. turnings	5.875c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.75c.	13.25c.
Zinc	2.25c.	3.50c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 11.25c. a lb. QUICKSILVER, $82-$83 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.50c. a lb. lcl.

Tin

Speculative profit taking in a dull market forced prices down almost ¾c. in the past week. The turnover in the London market has likewise been very light, but values did not suffer as much as here. Straits tin in New York today is quoted at 45.75c. as against 46.45c. a week ago. On first call in London this morning cash standards were priced at £215 10s. as compared with £216 5s. on Tuesday a week ago.

Lead

Authoritative estimates of a 43,000-ton figure for January shipments substantiate the reports made here of the favorable position of the domestic lead market. This estimate, together with the prospects of being called upon to provide material for sheathing for the power lines which the public utilities have indicated they would purchase when the TVA problem was settled, has apparently convinced consumers that nothing is to be gained by hand-to-mouth covering. As a result, the past week's sales were the highest lead sellers have experienced in some time. Domestic quotations are firm at 4.85c. per lb., New York, but this morning's spot price in London of 3.01c. per lb. represents a decline of 6 points from the price of a week ago.

Zinc

Contrary to expectations, prime Western sales in the past week showed a sharp improvement over the preceding week, the period's total of 5127 tons comparing with 1366 tons in the previous week. Shipments at 3912 tons showed little change from the preceding week. While hesitancy still characterizes the buying proclivities of most consumers, there is a growing tendency to cover further ahead than has been the practice in the past. The union of small tonnages on contract and favorable industrial news is credited with being chiefly responsible for the week's gain in sales. Domestic prices are unchanged at 4.89c. per lb., New York.

Non-Ferrous Average Prices

The average prices of the major non-ferrous metals in January, as based on quotations appearing in THE IRON AGE, were as follows:

	Per Lb.
Electrolytic copper, Conn. Valley	11.25c.
Lake copper, Eastern delivery	11.375c.
Straits tin, spot, New York	46.39c.
Zinc, East St. Louis	4.50c.
Zinc, New York	4.89c.
Lead, St. Louis	4.68c.
Lead, New York	4.83c.

IRON AND STEEL SCRAP

. . . Purchase of 10,000 tons of No. 2 steel by St. Louis consumer the only important transaction of the week . . . Composite unchanged at $14.875.

FEB. 7—Inclement weather had much to do with the lack of trading in most consuming centers during the past week, but the hampering of yard operations produced a temporary scarcity sufficient to lend a little strength to an otherwise listless market. The only important sale during the week past to a consumer involved 10,000 tons of No. 2 steel, to be taken by a ST. LOUIS mill over the next month or two. Because this sale was made at a price 50c. under the last sale of No. 2, the transaction weakened dealer buying prices in that area. With quoted prices on No. 1 heavy melting steel unchanged at PITTSBURGH, CHICAGO and PHILADELPHIA, however, the composite remains at $14.875 this week. Small consumers in the PITTSBURGH district are still paying as much as $16 for No. 1 and dealers are having difficulty in more than breaking even in covering the last big sale of No. 1 at $15.25 to the leading consumer. Railroad items are softer in many buying centers as a result of recent closings of lists.

Weather conditions have tended to give strength also to a sagging export market.

Pittsburgh

No. 1 heavy melting steel remains quotable this week at $15.25 to $16 a ton, unchanged from last week's range. Dealers are still making little headway covering recent sales of No. 1 steel made at $15.25. Some brokers are currently offering as high as $15.50 on other No. 1 heavy melting sales made into consumption at $15.50 and $16. Meanwhile, other consuming points in the district continue to pay as high as $16 a ton for No. 1 heavy melting. The Pennsylvania Railroad list is reported to have sold at a slightly lower figure than a month ago, while the B & D list brought about the same price as a month ago for railroad heavy melting steel.

Chicago

With only one major consumer regularly active in the market, trading is listless. Some activity resulted from the freeing of snow-choked roads and yards but it was mostly speculative. Railroad lists are small. Little steel can be bought for less than $13.75 and as high as $13.90 has been heard. Many items on the list are quoted nominally.

Philadelphia

Inclement weather has reduced the volume of material passing through local yards for processing, and a very spotty domestic demand and a moderate export demand serve to take care of all readily available material. In view of the poor operating rate for this territory, the price list is hard pushed to hold steady. Most mills here have little stock on hand, and when small orders are placed there is insistence on fairly quick delivery. This market's lethargy will probably continue for some time, or until the district operating rate approaches 45 per cent. The February list of Budd bundles, about 3000 tons, has apparently been placed with a dealer or broker, and all the information available indicates that the price varied little from that taking the January list.

Cleveland

Dealer to dealer transactions constituted most of the market activity during the past week. A few items have been revised on the basis of the recent railroad list quotations, but otherwise prices are unchanged. No. 1 heavy melting steel at $14 to $14.50 per ton here gains justifications by the recently reported sale of mixed scrap to a local mill which has been taking in this material.

Youngstown

Buying prices of dealers are tighter here, but no outstanding sale has been consummated to warrant any change in published quotations at this time. The difficulty dealers are reported having in covering at Pittsburgh has tended to counterbalance the downward tendency here. At the start of this week shipments were going forward to both Lowellville and Warren.

Buffalo

Following the decrease in district steelmaking activity, the scrap market looks for, temporarily at least, a continuation of the present quiet period. Releases have again been restricted by one of the large mills and no major buying has been evident. During the past week there have been practically no sales of cast scrap.

St. Louis

An East Side steel mill bought 10,000 tons of No. 2 heavy melting steel for delivery over the next 30 to 60 days, four dealers participating. The sale was at $12.50 a ton, or 50c. below the preceding sale, the decline being due to a freer movement plus the presence of same distress scrap. Other grades were affected by the decline. Selected heavy melting is off 75c. Nos. 1 and 2 heavy melting, machine shop turnings, rails for rolling. No. 1 machinery cast, and stove plate 50c. off; steel rails under 3 ft., and No. 1 railroad cast, 25c. lower, and steel car axles, $1 off. A railroad equipment specialist bought 3000 tons of No. 1 heavy melting steel, its first purchase in several years. Railroad lists: Missouri Pacific, 1340 tons; St. Louis Southwestern, 280 tons.

Cincinnati

The local old materials market is quiet. Some clippings and steel scrap are moving on contract, but mills are still backing away from the market unless offerings are attractive. Dealers' activity is confined to material for contract and to retain their supply sources. Yard supplies are in good shape, while quotations are unchanged. Improved steel operations gave basis for the stronger undertone the past week, despite the slowness of ordering.

Detroit

Month end automotive scrap lists which closed during the last week show scrap moving without difficulty at prices currently quoted with only minor variations. Short shoveling turnings, it is understood, went outside Detroit at prices close to those of a month ago. It is indicated that the sidewise movement will continue uninterrupted until factors outside this area come into play.

Boston

Snows, sleet and freezing weather put a damper on business the past week. In quite a few instances yards operated but one day. While some brokers have withdrawn from the market temporarily, others are still engaged in exporting scrap. A boat here is loading presumably for Italy, and another is expected to arrive this week. Barge shipments of export material are still going forward from Providence to New York. The New Haven railroad has sold approximately 3½ miles of trackage with sidings to a Chelsea, Mass., firm. These rails are not involved in litigation and will be exported when weather conditions are more moderate. The railroad is dickering on a larger tonnage of rails extending from Greenbush to Plymouth, Mass., also not involved in litigation.

New York

The anticipated decline in exporters' buying prices did not materialize largely owing to weather conditions. Yard operations and barge loading were slowed up by freezing temperatures, and the temporary shortage was aggravated by the arrival of steamers a few days ahead of schedule. With a freer flow of scrap and particularly as the older orders become exhausted, the effect of the last Japanese purchases are more likely to be felt. The European Scrap Cartel met in London this week, but no action had been taken up until the time of going to press, as regards buying in this country. None was looked for at this time.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$15.25 to $16.00
Railroad hvy. mltng...	16.25 to 16.75
No. 2 hvy. mltng. steel	14.25 to 14.75
Scrap rails	16.50 to 17.00
Rails 3 ft. and under..	18.00 to 18.50
Comp. sheet steel	15.25 to 16.00
Hand bundled sheets..	14.50 to 15.00
Hvy. steel axle turn..	14.00 to 14.50
Machine shop turn....	10.00 to 10.50
Short shov. turn.....	10.50 to 11.00
Mixed bor. & turn.....	.... 8.75
Cast iron borings.....	.... 8.75
Cast iron carwheels...	15.00 to 15.50
Hvy. breakable cast...	12.50 to 13.00
No. 1 cupola cast.....	15.25 to 15.75
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels....	18.00 to 18.50
Low phos. billet crops.	18.50 to 19.00
Low phos. punchings.	17.50 to 18.00
Low phos. plate	17.00 to 17.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$15.00 to $15.50
No. 2 hvy. mltng. steel	13.00 to 13.50
Hydraulic bund., new	14.50 to 15.00
Hydraulic bund., old..	11.50 to 12.00
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels...	16.50 to 17.00
Hvy. breakable cast...	15.50 to 16.00
No. 1 cast	16.50 to 17.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable ...	15.50 to 16.00
Machine shop turn....	8.50 to 9.00
No. 1 blast furnace....	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings..	10.00 to 10.50
No. 1 low phos. hvy...	.... 17.00
Couplers & knuckles..	.... 17.00
Rolled steel wheels...	.... 17.00
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)..	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$13.50 to $14.00
Auto. hvy. mltng. steel alloy free	12.00 to 12.50
No. 2 auto. steel	11.50 to 12.00
Shoveling steel	13.50 to 14.00
Factory bundles	12.50 to 13.00
Dealers' bundles	12.00 to 12.50
Drop forge flashings..	10.00 to 10.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling, old..	5.75 to 6.25
Rolled carwheels	15.00 to 15.50
Railroad tires, cut....	15.00 to 15.50
Railroad leaf springs..	15.25 to 15.75
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	12.50 to 13.00
Coil springs	16.00 to 16.50
Axle turn. (elec.).....	13.50 to 14.00
Low phos. punchings.	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	5.25 to 5.75
Short shov. turn.	7.00 to 7.50
Machine shop turn....	6.50 to 7.00
Rerolling rails	16.75 to 17.25
Steel rails under 3 ft..	**15.75 to 16.25**
Steel rails under 2 ft..	**16.25 to 16.75**
Angle bars, steel	15.25 to 15.75
Cast iron carwheels...	12.25 to 12.75
Railroad malleable	15.00 to 15.50
Agric. malleable	**11.25 to 11.75**
	Per Net Ton
Iron car axles	18.50 to 19.00
Steel car axles	18.00 to 18.50
Locomotive tires	14.00 to 14.50
Pipes and flues	9.00 to 9.50
No. 1 machinery cast.	12.50 to 13.00
Clean auto. cast.	13.00 to 13.50
No. 1 railroad cast....	11.00 to 11.50
No. 1 agric. cast.....	10.25 to 10.75
Stove plate	7.75 to 8.25
Grate bars	9.00 to 9.50
Brake shoes	9.25 to 9.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$15.50 to $16.00
No. 2 hvy. mltng. steel	14.50 to 15.00
Low phos. plate	16.00 to 16.50
No. 1 busheling	14.50 to 15.00
Hydraulic bundles	14.75 to 15.25
Machine shop turn.	**9.75 to 10.25**

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	13.50 to 14.00
Comp. sheet steel	13.50 to 14.00
Light bund. stampings	10.75 to 11.25
Drop forge flashings..	12.50 to 13.00
Machine shop turn....	7.00 to 7.50
Short shov. turn.....	7.50 to 8.00
No. 1 busheling	13.00 to 13.50
Steel axle turnings....	11.00 to 11.50
Low phos. billet and bloom crops	18.00 to 18.50
Cast iron borings	7.75 to 8.25
Mixed bor. & turn....	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars ..	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	18.25 to 18.75
Rails for rolling	17.00 to 17.50
Railroad malleable ...	15.50 to 16.00
Cast iron carwheels ..	14.50 to 15.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. b'ndled sheets	12.00 to 12.50
Old hydraul. bundles..	10.75 to 11.25
Drop forge flashings...	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings....	10.50 to 11.00
Machine shop turn....	6.50 to 7.00
Knuckles & couplers..	16.50 to 17.00
Coil & leaf springs....	16.50 to 17.00
Rolled steel wheels....	16.00 to 16.50
Low phos. billet crops.	15.50 to 16.00
Shov. turnings	8.75 to 9.25
Mixed bor. & turn.....	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast..	15.50 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft..	18.00 to 18.50
Cast iron carwheels...	13.50 to 14.00
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$12.25 to $12.75
No. 1 hvy. melting....	12.00 to 12.50
No. 2 hvy. melting....	11.50 to 12.00
No. 1 locomotive tires.	13.50 to 14.00
Misc. stand. sec. rails.	14.50 to 15.00
Railroad springs	15.50 to 16.00
Bundled sheets	7.50 to 8.00
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.....	2.50 to 3.00
Machine shop turn....	3.00 to 3.50
Heavy turnings	9.50 to 10.00
Rails for rolling.....	16.50 to 17.00
Steel car axles	17.50 to 18.00
No. 1 RR. wrought....	10.50 to 11.00
No. 2 RR. wrought....	12.50 to 13.00
Steel rails under 3 ft..	16.00 to 16.50
Steel angle bars	14.50 to 15.00
Cast iron carwheels...	14.50 to 15.00
No. 1 machinery cast..	14.50 to 15.00
Railroad malleable ...	12.00 to 12.50
No. 1 railroad cast....	12.50 to 13.00
Stove plate	8.50 to 9.00
Grate bars	9.00 to 9.50
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$11.50 to $12.00
No. 2 hvy. mltng. steel	9.25 to 9.75
Scrap rails for mltng.	15.25 to 15.75
Loose sheet clippings.	6.75 to 7.25
Hydrau. b'ndled sheets	11.00 to 11.50
Cast iron borings	3.50 to 4.00
Machine shop turn....	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	2.75 to 3.25
Rails for rolling	17.50 to 18.00
No. 1 locomotive tires.	14.25 to 14.75
Short rails	18.00 to 18.50
Cast iron carwheels...	12.75 to 13.25
No. 1 machinery cast.	13.50 to 14.00
No. 1 railroad cast....	12.75 to 13.25
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricul. malleable	11.75 to 12.25
Railroad malleable	14.25 to 14.75
Mixed hvy. cast.....	10.50 to 11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel....	$12.50 to $14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings..	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	.... 10.00
Rails for rolling	16.00 to 16.50
No. 1 cast.	.... 14.50
Tramcar wheels	.... 14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	$10.50 to $11.00
No. 2 hvy. mltng. steel.	9.50 to 10.00
Borings and turnings.	5.75 to 6.25
Long turnings	5.50 to 6.00
Short shov. turnings..	6.00 to 6.50
No. 1 machinery cast..	12.25 to 12.75
Automotive cast	13.50 to 14.00
Hvy. breakable cast...	9.75 to 10.25
Hydraul. comp. sheets.	11.75 to 12.25
Stove plate	8.00 to 8.50
New factory bushel...	10.75 to 11.25
Sheet clippings	8.25 to 9.25
Flashings	9.50 to 10.00
Low phos. plate scrap	12.00 to 12.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$10.50 to $11.00
No. 2 hvy. mltng. steel.	9.00 to 9.50
Hvy. breakable cast...	$11.50 to 12.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	20.00 to 20.50
Shafting	15.50 to 16.00
No. 1 RR. wrought....	11.00 to 11.50
No. 1 wrought long....	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*..	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace...	3.50 to 4.00
Cast borings (chem.)..	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	$13.50 to $14.00
No. 2 cast†	10.50 to 11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	$10.15
Machine shop turn....	.... 3.38
Mixed bor. & turn....	$2.00 to 2.25
Bun. skeleton long....	.... 8.15
Shafting	15.50 to 15.65
Cast bor. chemical....	5.50 to 5.75
Per gross ton delivered consumers' yards:	
Textile cast	$12.50 to $14.00
No. 1 machine cast....	12.50 to 14.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.50 to $14.00
No. 2 hvy. mltng. steel.	11.50 to 13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng steel.	$9.75	$9.25
No. 2 hvy. mltng. steel.	8.25	7.75
Mixed dealers steel....	7.00	6.50
Scrap pipe	5.50	5.00
Steel turnings	5.00	4.50
Cast borings	3.75	3.25
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.00

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	$12.00 to $12.50
No. 2 hvy. mltng. steel.	10.00 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	$13.50
No. 2 hvy. mltng. steel	12.50
Rails (scrap)	13.50
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

(Prices are f.o.b. unless otherwise indicated)

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.25c.
Detroit, delivered	2.35c.
Duluth	2.35c.
Philadelphia, delivered	2.57c.
New York	2.59c.
On cars dock Gulf ports	2.60c.
On cars dock Pacific ports	2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c. to 2.05c.
Detroit, delivered	2.00c. to 2.15c.
On cars dock Tex. Gulf ports	2.25c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.75c. to 1.90c.
Detroit, delivered	1.85c. to 2.00c.
On cars dock Tex. Gulf ports	2.10c. to 2.25c.
On cars dock Pacific ports	2.35c.

Prices on reinforcing bars have been subject to concessions of $3 a ton or more from above quotations.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.
Philadelphia, del'd	2.15c.
New York, del'd	2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P't'g	3.80c.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	.285c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	2.15c.
Detroit, delivered	2.25c.
Philadelphia, delivered	2.32c.
Granite City	2.25c.
On cars dock Pacific ports	2.65c.
Wrought iron, Pittsburgh	4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.20c.
Detroit, delivered	3.30c.
Granite City	3.30c.
Philadelphia, delivered	3.52c.
On cars dock Pacific ports	3.30c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	4.95c.
Special Dynamo	5.65c.
Transformer	6.15c.
Transformer Special	7.15c.
Transformer Extra Special	7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus $5c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.95c.
F.o.b. cars dock Pacific ports	4.65c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

***Tin Plate**

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

	Per Base Box
Granite City	$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	4.00c.

HOT ROLLED STRIP

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.15c.
Detroit, delivered	2.25c.

Cooperage Stock

Pittsburgh & Chicago	2.25c.

COLD ROLLED STRIP*

	Base per Lb.
Pittsburgh, Youngstown or Cleveland	2.95c.
Chicago	3.05c.
Detroit, delivered	3.05c.
Worcester	3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	3.10c
Detroit, delivered	3.20c.
Worcester	3.50c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.95c.	3.15c.
Carbon	.51 .75	4.30c.	4.50c.
Carbon	.76-1.00	6.15c.	6.35c.
Carbon	1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.15
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbless wire	3.20
Woven wire fence, base column.	67
Single loop bale ties, base col...	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool..	$2.54

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	56	36	¼ & ⅜	.+ 9	+30
¼ to ⅜	.59	43½	½	24	6½
½	....63½	54	¾	30	13
¾	....66½	58	1 & 1¼	..34	19
1 to 3	..68½	60½	1½	38	21½
			2	....37½	21

Lap Weld

2	61	52½	2	....30½	15
2½ & 3	..64	55½	2½ to 3½	31½	17½
3½ to 6	.66	57½	4	....33½	21
7 & 8	..65	55½	4½ to 8	.32½	20
9 & 10	..64½	55	9 to 12	..28½	15
11 & 12	..63½	54			

Butt weld, extra strong, plain ends

⅛	....54½	41½	¼ & ⅜	.+10	+43
½ to ⅞	.56½	45½	½	25	9
½	....61½	53½	¾	31	15
¾	....65½	57½	1 to 2	..38	22½
1 to 3	..67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	....33½	18½
2½ & 3	63	55½	2½ to 4.39	½	25½
3½ to 6.66	½	59	4½ to 6.37	½	24
7 & 8	..65½	56	7 & 8	..38½	24½
9 & 10	..64½	55	9 to 12	..32	20½
11 & 12	..63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d....13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d...13 B.W.G.	10.67	9.26	....
1½ in. o.d...13 B.W.G.	11.79	10.23	$9.72
1¾ in. o.d...13 B.W.G.	13.42	11.64	11.06
2 in. o.d....13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d...13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d...12 B.W.G.	18.45	16.01	15.16
2½ in. o.d...12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d...12 B.W.G.	21.42	18.59	17.54
3 in. o.d....12 B.W.G.	22.48	19.50	18.35
3½ in. o.d...11 B.W.G.	28.37	24.62	23.15
4 in. o.d....10 B.W.G.	35.20	30.54	28.66
4½ in. o.d...10 B.W.G.	43.04	37.35	35.22
5 in o.d..... 9 B.W.G	54.01	46.87	44.25
6 in. o.d..... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
½ in. & 6 in. and smaller.65, 5 and 5*
Larger and longer up to 1 in. 60, 10 and5*
1⅛ in. and larger....60, 5 and 5*
Lag bolts 60, 10 and5
Plow bolts, Nos. 1, 2, 3 and 7 ....65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:
½ in. and smaller ....65 and 5
9/16 in. to 1 in. inclusive.60, 5 and 5
1⅛ in. and larger....60 and 5

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts U.S.S. S.A.E.
½ in. and smaller.... 65-5 70
9/16 to 1 in. 60-10 65
1⅛ in. and larger.... 60-5 60-5
In full container lots, 10 per cent additional discount.
Stove bolts in packages, nuts attached 75
Stove bolts in packages, with nuts separate ....75 and 12½
Stove bolts in bulk.... 85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham $3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ....65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller....50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller ....73 and 10
Milled headless set screws, cut thread ¾ in. and smaller..68 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller ....65 and 10
Upset set screws, cup and oval points ....73 and 10
Milled studs ....57 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base ....2.80c.
Delivered, Detroit ....2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1¼% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel....	0.15
6100 Chromium-vanadium bar ..	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium ...	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes.	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ..	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	.18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d.
Steel bars, open hearth.	£10 8s.
Beams, open-hearth	£10
Channels, open-hearth ..	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage.	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	$22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron	11c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	31c.
Man., African, Indian, 44-48%	29c.
Man., African, Indian, 49-51%	31c.
Man., Brazilian, 46 to 48½%	28c.

Per Short Ton. Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$19.50
Tungsten, domestic, scheelite delivered	$18.00 to $19.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	23.00
Turkish, 48-49%	23.00
Turkish, 45-46%	19.00
Turkish, 40-44%	16.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$24.00
48-49%	22.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$17.00 to $18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	18.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2, f.o.b., Bayonne	4.00c.
No. 6, f.o.b., Bayonne	2.26c.
No. 5 Bur. Stds., del'd Chicago	3.25c.
No. 6 Bur. Stds., del'd Chicago	2.75c.
No. 3 distillate, del'd Cleve'd	5.50c.
No. 4 industrial, del'd Cleve'd	5.25c.
No. 5 industrial, del'd Cleve'd	3.00c.
No. 6 industrial, del'd Cleve'd	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

REINFORCING STEEL

. . . Awards of 10,550 tons; 8610 tons in new projects.

NORTH ATLANTIC STATES
AWARDS

750 Tons, Jamestown, R. I., highway toll bridge, to Bethlehem Steel Co., Bethlehem, Pa.; through Merritt, Chapman & Scott Co., contractor.

475 Tons, Little Falls, N. J., concrete arch bridge, to Bethlehem Steel Co.; through Bates & Rogers Construction Corp., contractor.

300 Tons, Southbury, Conn., Group D, State training school and farm, to Truscon Steel Co., Youngstown; through E. & F. Construction Co., contractors.

270 Tons, Queens, N. Y., grade crossing elimination, to Truscon Steel Co., Youngstown; through Nicholas Di Menna & Sons, New York.

230 Tons, New Rochelle, N. Y., barracks, Fort Slocum, to Bethlehem Steel Co., Bethlehem, Pa.; through Sol Lustbader, Inc., contractor.

163 Tons, New York, bulkhead and sea wall, to Bethlehem Steel Co.; through Allen N. Spooner & Son, contractors.

125 Tons, Rockaway Beach, N. Y., three concession buildings, to Truscon Steel Co.; through Graves-Quinn Corp., contractor.

125 Tons, Malden, Mass., Lincoln school, to Northern Steel Co.; through James Sheppard, Everett, Mass., contractor.

100 Tons, Queens, N. Y., grade separation at Hillside Avenue, to Truscon Steel Co.; through A. & J. Cianciulli, contractors.

CENTRAL AND WESTERN STATES

1717 Tons, Seattle, Lake Washington bridge, unit 11, to Bethlehem Steel Co., Seattle; through Rumsey & Co., Seattle, contractor.

982 Tons, Denver, Federal detention buildings, to Colorado Builders Supply Co., Denver; through Thomas Bates & Sons, Denver, contractors.

823 Tons, Seattle, Lake Washington Bridge, unit 2, to Seattle Steel Co.; through Bates & Rogers, Chicago, contractors.

740 Tons, Seattle, Lake Washington Bridge, unit 7, to Seattle Steel Co.; through Dally Construction Co., Seattle, contractor.

642 Tons, Seattle, Lake Washington Bridge, unit 1, to Bethlehem Steel Co., Seattle; through Northwest Construction Co., Seattle, contractor.

450 Tons, Manitowoc, Wis., waterworks, to Jos. T. Ryerson & Son, Inc., Chicago; through A. L. Jackson Co., contractor.

300 Tons, Wadsworth, Kan., incinerator building to Sheffield Steel Corp., Kansas City.

260 Tons, Indianapolis, Link Belt Co. building, to Pollak Steel Co., Cincinnati.

260 Tons, Austin, Minn., sewage plant, to Bethlehem Steel Co., Bethlehem, Pa.; through McGough, contractor.

250 Tons, Miami, Mo., Missouri River bridge, to Sheffield Steel Corp.; through Massman Construction Co., contractor.

200 Tons, Indianapolis, coliseum, to Pollak Steel Co.

200 Tons, Manteno, Ill., ward buildings, to Calumet Steel Co., Chicago; through Permanent Construction Co., contractor.

200 Tons, Madison, Wis., nurses' home, Madison General Hospital, to Joseph T. Ryerson & Son, Inc.; through J. Nelson Co., contractor.

200 Tons, Madison, Wis., sewage disposal plant, to Joseph T. Ryerson & Son, Inc.; through Paul Nagtegaal & Sons, contractors.

175 Tons, Hamilton, Mont., health service building, to Truscon Steel Co.; through McGough Brothers, contractors.

160 Tons, Madison, Wis., Marquette School, to Bethlehem Steel Co., Bethlehem, Pa.

120 Tons, LaCrosse, Wis., two schools, to Bethlehem Steel Co., Bethlehem, Pa.; through Standard Construction Co., contractor.

120 Tons, Waterloo, Iowa, sewage disposal plant, to Laclede Steel Co., St. Louis; through Waterloo Construction Co.

115 Tons, White River, Ark., Village Creek levee, to Jones & Laughlin Steel Corp., Pittsburgh; through E. Morgan, contractor.

100 Tons, Cudahy, Wis., school addition, to Truscon Steel Co., Youngstown.

PENDING REINFORCING BAR PROJECTS
ATLANTIC STATES

300 Tons, Clifton, N. J., five highway bridges; bids Feb. 24.

175 Tons, Queens, N. Y., Cross Island Parkway, contract MC-39-2; bids to Department of Parks until Feb. 20.

CENTRAL AND WESTERN STATES

2750 Tons, Chicago, fourth section subway; bids Feb. 16.

1000 Tons, Oregon and Washington points, tower foundations for Bonneville transmission system; bids Feb. 21.

800 Tons, Chicago, marine drive apartment project.

800 Tons, Chicago, extension to R. R. Donnelley & Son Printing Plant.

530 Tons, Rockford, Ill., school, C. B. Johnson, low bidder.

280 Tons, Columbus, Ohio, dormitory; bids due Feb. 16.

268 Tons, South Bend, Ind., school; bids in.

265 Tons, Santa Ana, Cal., bridge; bids Feb. 23.

250 Tons. St. Louis, post office garage; bids due Feb. 16.

200 Tons, San Bernardino, Cal., two bridges; bids Feb. 23.

170 Tons, Chicago, Children's Memorial Hospital.

150 Tons, Waterloo, Iowa, Park Avenue bridge.

120 Tons, Peru, Ill., sewage plant.

120 Tons, New Roads, La., courthouse.

114 Tons, Bowie, Ariz., highway work; bids Feb. 17.

110 Tons, Hoisington, Kan., school.

109 Tons, Eureka, Cal., high school shop; bids in.

100 Tons, East St. Louis, Ill., police and fire station; Dickie Construction Co., St. Louis, general contractor.

Steel Freight Rate Cut Extension Denied By ICC

WASHINGTON. — The Interstate Commerce Commission has denied an application of railroads to continue present reduced carload rates on iron and steel products from mid-western points to St. Paul, Minneapolis and Duluth, without observing the long-and-short-haul provision. The originating towns are Chicago and Peoria, Manitowoc and Milwaukee, St. Louis and Kansas City, and points taking the same rates. The carriers proposed to establish higher rates based on 32.5 per cent of the first class from, to and between intermediate points. The commission said the railroads had failed to prove that the proposed rates would not create infractions of provisions of the act, other than the long-and-short-haul clause.

Representatives of manufacturers and distributors of iron and steel articles at Des Moines, Waterloo, Cedar Rapids, and Mason City, Iowa, protested against increasing the present rates from or to points intermediate to Duluth and the Twin Cities on applicants' routes. A manufacturer at Kansas City, who has available the competitive rates to the Twin Cities and Duluth, also protested against the increases proposed to the intermediate points.

Morrow Disowns No. 1 Ranking for South

PITTSBURGH.—The South is not the "No. 1 economic problem of the nation," Hugh Morrow, president, Sloss Sheffield Steel & Iron Co., Birmingham, told 1000 members and guests of the Engineers Society of Western Pennsylvania at their 55th annual banquet held at Pittsburgh this week. Mr. Morrow cited figures indicating phenomenal growth of the South since 1880.

"The South takes issue with anyone that its economic condition is the cause of the nation's economic unbalance. She wants to be left alone to work out her own way without the help of streamline uplifters and dream boys," he said.

Langdon S. Simons Heads Steel Export Ass'n Office

LANGDON S. SIMONS has taken charge of the New York office and activities of the Steel Export Association of America. Mr. Simons has had an extensive experience in export trade and is thoroughly acquainted with international commerce. For the past eight years he has been sales manager of Norton Co.'s English factory located near London.

Warehouse Association Convention May 16-17

CLEVELAND. — The American Steel Warehouse Association, Inc., will hold its thirtieth annual convention at the Drake Hotel, Chicago, May 16 and 17.

Fourth Quarter Steel Profits Shade Higher

Some of the steel companies reporting during the past week on their 1938 earnings are:

	4th quar. 1938	4th quar. 1937	12 mos. 1938	12 mos. 1937
Inland Steel Co.	$1,759,785	$867,571	$4,916,203	$12,665,317
National Steel Corp.	2,753,156	2,580,925	6,661,651	17,801,893
Republic Steel Corp.	308,613	237,323*	7,997,825*	9,044,147
Continental Steel Corp.	228,000	21,041	630,000	814,553
Carpenter Steel Co.	60,281	54,516	21,122**	309,631**
Acme Steel Co.	202,726	171,341*	375,872	1,898,091
Keystone Steel & Wire Co.	115,728	32,226	690,757	1,017,971
Rustless Iron & Steel Corp.	158,463	82,212	81,110	713,139

* = loss ** Profit last 6 mos.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

RCA Mfg. Co., 411 Fifth Avenue, New York, subsidiary of Radio Corp. of America, Inc., 30 Rockefeller Plaza, will take bids soon on general contract for one-story and basement addition, 250 x 400 ft., to branch plant at 501 North La Salle Street, Indianapolis, for expansion in assembling division. Cost close to $200,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer. H. E. LeRoy is plant manager at Indianapolis.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for steam-driven air compressor, condenser, wet-vacuum pumping unit and auxiliary equipment, including piping, for installation at Brooklyn Navy Yard (Specifications 9058).

Metropolitan Plumbing Supply, Inc., New York, has leased space in building at 313-15 East Thirty-first Street for new storage and distributing plant and company headquarters.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until Feb. 13 for drop forgings and steel catches (Circular 135); until Feb. 14, inspection gages (Circular 133); until Feb. 16, one horizontal, hydraulic honing machine (Circular 126).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 14 for four motor-driven band scroll saws (Schedule 5464); until Feb. 17, 16,000 ft. of air hose for diving apparatus (Schedule 5469); until Feb. 21, four steel crankshafts, finished, with pipe lugs and steel tubing for oil holes (Schedule 5510) for Brooklyn Navy Yard; until Feb. 17, 16 centrifugal purifiers, lubricating and diesel oil, with spare parts, tools and wrenches (Schedule 5483) for Brooklyn and Philadelphia yards.

Artistic Lamp Mfg. Co., Inc., 395 Fourth Avenue, New York, manufacturer of lamps and lighting fixtures, has leased space in building at 116-20 East Twenty-seventh Street, for plant.

National Lead Co., 111 Broadway, New York, plans rebuilding part of branch plant at Brooklyn, recently destroyed by fire. Loss over $100,000 with equipment.

Port Quartermaster, New York Port of Embarkation, Brooklyn, asks bids until Feb. 16 for one compressed air horn for fire alarm system, with motor-driven air compressor with automatic control and self-contained cooling system (Circular 626-16).

Agar Mfg. Corp., Thomas Street, Whippany, N. J., manufacturer of corrugated boxes and containers, has asked bids on general contract for new branch plant at Kansas City, Mo., consisting of a main one-story manufacturing unit, 150 x 400 ft.; storage and distributing building, 100 x 400 ft.; corrugating unit, 60 x 320 ft.; power house, 40 x 60 ft., and office building, 40 x 120 ft. Cost over $150,000 with equipment.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Feb. 13 for 24,200 aluminum caulking screw rings, stamped from strip or sawed from tubing (Circular 549); until Feb. 15, one 3-ton chain hoist, two snatch blocks, three steel tackle blocks (Circular 557), 600 ft. of ¾-in. wire rope (Circular 556).

Philco Refrigerator Co., Philadelphia, recently organized as a subsidiary of Philadelphia Storage Battery Co., Ontario and C Streets, Philadelphia, to manufacture electric refrigerators and parts, will make extensions and improvements in former plant of Conservador Refrigerator Division of Fairbanks, Morse & Co., 2060 Northwestern Avenue, Indianapolis, secured under lease. Equipment installation will cost about $50,000. W. Paul Jones is president of new company, which will be closely associated with Philco Radio & Television Corp., Philadelphia.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Feb. 13 for two adjustable vertical steel-wood drawing tables and one steel construction reference table (Circular 700); until Feb. 15, unit heaters for buildings Nos. 219 and 220 (Circular 701).

BUFFALO DISTRICT

Bell Aircraft Corp., 2050 Elmwood Avenue, Buffalo, airplanes and parts, is arranging for sale of common stock to total about $1,240,000, of which approximately $250,000 will be expended for additional machinery and equipment; a considerable part of fund also will be used for engineering and research, and purchase of raw materials.

United States Engineer Office, Federal Building, Buffalo, asks bids until Feb. 14 for bronze valves: also for one pressure-reducing valve, six gas cocks and valve parts (Circular 97).

Coca-Cola Bottling Co., 9 Dudley Street, Glens Falls, N. Y., plans new one-story mechanical-bottling plant at South Glens Falls. Cost about $50,000 with equipment. Melvin L. and Harry A. King, Dennison Building, Syracuse, N. Y., are architects.

NEW ENGLAND

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Feb. 23 for new shipbuilding ways at Portsmouth, N. H., Navy Yard, including steel frame building, crane runways and other facilities (Specifications 9061).

Coca-Cola Bottling Co., 30 Washington Street, Boston, has asked bids on general contract for one-story mechanical-bottling works at Worcester, Mass. Cost close to $50,000 with equipment. J. M. Shelton, Bona Allen Building, Atlanta, Ga., is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Feb. 14 for two 75-ton hydraulic presses, one open rod type and other housed guide type (Circular 287), one electric spot welding machine (Circular 265), 5000 click springs and 6000 operating rod springs (Circular 285); until Feb. 15, four horizontal, plain automatic milling machines, bed or knee type (Circular 282).

School Board, Old Lyme, Conn., plans one-story addition to local high school, primarily for expansion in manual training shops. Fund of $40,000 has been authorized for building, exclusive of equipment.

WASHINGTON DIST.

Quartermaster Depot, War Department, Washington, asks bids until Feb. 17 for steel clothes lockers, various deliveries, including 2000 single type, 850 double, 600 triple and 775 quadruple type (Circular 950-111).

International Harvester Co., 180 North Michigan Avenue, Chicago, has asked bids on general contract for new one-story factory branch, storage and distributing plant at Garrett Avenue and Twenty-fifth Street, Baltimore. Cost over $75,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for 38 electric overhead traveling bridge cranes for navy yards at Boston, Brooklyn, Norfolk, Philadelphia, Charleston, S. C., Mare Island, Puget Sound, and naval operating base at San Diego (Specifications 9111).

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Feb. 13 for one electric drying oven (Circular 240).

Ruckert Marine Fertilizers, Inc., 1409 Thames Street, Baltimore, an interest of Ruckert Terminals Corp., same address, plans one-story commercial fertilizer plant, 125 x 340 ft., at 2100 Clinton Street. Cost over $65,000 with equipment, including mechanical-handling facilities.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 13 for galvanized barbed wire, copper tubing, copper nails, tool holders, steel snatch blocks, wood snatch blocks, grease cups, 48 steel wire wheel brushes, two pneumatic rock hand drills, two pneumatic paving breakers (Schedule 3421).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 17 for welding electrodes and rods (Schedule 3820); until Feb. 21, steel rivets and washers (Schedule 5495), chains (Schedule 5491), electric cable (Schedule 5502), electric heat and flame resistant cable (Schedule 5496); until Feb. 24, four steam winches (Schedule 5511); until Feb. 28, bolts, brackets, catches grommets, etc. (Schedule 5516), cotter pins, escutcheon pins and taper pins (Schedule 5515) for Eastern and Western navy yards; until Feb. 21, four turbine-driven main feed centrifugal pumps and spare parts (Schedule 5470) for Washington yard.

SOUTH ATLANTIC

National Oil Products Co., Cedartown, Ga., manufacturer of refined oil specialties, has awarded general contract to Wright & Lopez Co., Cedartown, for one-story addition, 60 x 100 ft. Cost close to $45,000 with equipment. Main offices of company are at Harrison, N. J.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for circulating pumps, heat exchanger, electrical equipment, piping systems and auxiliary equipment for power house at naval air station, Pensacola, Fla. (Specifications 9090).

City Council, Atlanta, Ga., is considering expansion and improvements at municipal airport, including purchase of 200 acres of additional land, construction of steel hangars, shops and other facilities. Proposed to arrange a fund of $1,000,000 for project. Jack Gray is manager at airport.

WESTERN PA. DIST.

Allegheny Ludlum Steel Corp., Oliver Building, Pittsburgh, has let general contract to Austin Co., Cleveland, for new one and two-story factory branch, storage and distributing plant, 85 x 135 ft., at 4735 South Kedzie Avenue, Chicago. Cost over $100,000 with equipment.

United States Engineer Office, Huntington, W. Va., will ask bids soon for seven pumping plants in connection with flood control project in that area. Cost about $250,000 with pumping machinery and auxiliary equipment.

Citizens Electric Co., Market Street, Lewisburg, Pa., is considering new steam-electric generating station. Cost over $150,000 with engine-generator unit and auxiliary equipment.

OHIO AND INDIANA

Rex Metal Parts Co., 1295 West Seventy-eighth Street, Cleveland, manufacturer of sheet metal products, etc., has let general contract to Albert M. Higley Co., 2036 East Twenty-second Street, for one-story addition, 35 x 75 ft., for storage and distribution, including alterations in present plant. Cost close to $40,000 with equipment.

Board of County Commissioners, New Courthouse, Cleveland, has approved plans for one-story machine shop, 120 x 160 ft., and one-story equipment storage and distributing building, 90 x 160 ft., at Independence, Ohio. Cost over $85,000 with equipment. John O. McWilliams, Standard Building, Cleveland, is County engineer.

Commanding Officer, Ordnance Department, Erie Ordnance Depot, Lacarne, Ohio, asks bids until Feb. 16 for flat nailless steel packing case strapping (Circular 8).

Ohio Edison Co., Springfield, Ohio, has authorized appropriation of about $4,000,000 for expansion and improvements in power plants and system this year, including new 35,000-kw. turbo-generator and auxiliary equip-

ment in power station, new transmission and distributing lines, power substations, switching stations and other structures.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 13 for 48,800 interlocking fasteners, 1000 slider and pull, 1000 bottom stops, 2000 top stops, 11,000 post and washer fasteners, and 11,000 socket and washer fasteners (Circular 642); until Feb. 14, 53 tow target windlass assemblies, 170 electric motors, 135 tow target windlass brake band assemblies (Circular 614); until Feb. 15, clevis and eye bolts for aircraft (Circular 613); until Feb. 16, about 265,000 ft. of flexible cable (Circular 634), 12 magnetic drag, shaft-driven type tachometers (Circular 622); until Feb. 24, 973 oxygen cylinder assemblies, and 150 oxygen valve assemblies (Circular 623).

International Harvester Co., 180 North Michigan Avenue, Chicago, has let general contract to J. L. Simmons & Co., Inc., Union Title Building, Indianapolis, for extensions and improvements in foundry No. 3 at local motor truck plant on Brookville Road. Cost over $150,000 with equipment. This is part of expansion and improvement program at this works during present year, with ultimate cost close to $1,000,000.

MICHIGAN DISTRICT

Divco-Twin Truck Co., 12801 East Jefferson Avenue, Detroit, manufacturer of small motor trucks, has asked bids on general contract for one-story and basement plant, 250 x 500 ft., on Hoover Road, for parts production and assembling. Cost close to $250,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Fisher Body Division, General Motors Corp., Detroit, has approved plans for addition to branch plant at Grand Rapids, Mich., for expansion in press room and storage and distributing division. Extensions and imrovements also will be made in power house. Production facilities will be increased about 30 per cent. Cost close to $1,000,000 with machinery.

Kellogg Co., Battle Creek, Mich., manufacturer of cereals, has approved plans for one-story factory branch, storage and distributing plant at Memphis, Tenn., totaling about 12,000 sq. ft. of floor space. Cost close to $45,000 with equipment. New unit will be operated in name of Kellogg Sales Co., an affiliated interest. Memphis offices are in Columbian Mutual Building.

SOUTHWEST

State Highway Department, Oklahoma City, Okla., is considering new cement mill at Davis, Okla., with output to be used for State highways. It will consist of several one and multi-story units, with storage and distributing facilities, power house and other structures. Cost close to $500,000 with machinery. V. T. Moon, State Capitol Building, Oklahoma City, is State engineer.

Gene Williams, secretary, Chamber of Commerce, Helena, Ark., is at head of project to operate a local plant for production of airplane bodies. Negotiations are being completed for acquisition of works of Ozark Trailer Corp., near landing field of municipal airport, for line of output noted, including parts and production and assembling. A company will be organized to carry out project.

City Council, Slater, Mo., asks bids until Feb. 18 for cooling tower, circulating water pumps and other equipment for municipal electric power plant; also for electrical distributing lines. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Brunswick-Balke-Collender Co., 629 South Wabash Avenue, Chicago, manufacturer of bowling alleys, billiard tables, etc., has let general contract to Morris Hoffman Construction Co., Inc., Victor Building, Kansas City, Mo., for one-story factory branch, storage and distributing plant at 1608-14 Baltimore Avenue, Kansas City, 115 x 130 ft. Cost over $70,000 with equipment. Keene & Simpson, Land Bank Building, Kansas City, are architects.

National Aircraft Co., Fort Worth, Tex., care of A. P. Barrett, Trinity Life Building, president, has acquired tract near local airport for new plant for production of military airplanes. Plans are being completed for initial group of four one-story buildings, totaling about 90,000 sq. ft. of floor space, for parts manufacture and assembling. Work will begin soon. Cost over $125,000 with equipment. Herbert Rawdon will be chief engineer at plant and will supervise erecton.

Danciger Oil & Refining Co., Longview, Tex., plans new oil refinery at Corpus Christi, Tex., with initial capacity for handling about 6000-bbl. of crude oil per day. Cost close to $100,000 with equipment.

SOUTH CENTRAL

Gatecity Table Co., Inc., 1390 Blashfield Street, Atlanta, Ga., manufacturer of enameled iron table tops, enameled iron furniture, etc., has leased building at 2809-17 Perdido Street, New Orleans, totaling close to 14,000 sq. ft. of floor space, for new branch plant.

Armstrong Rubber Co., Inc., West Haven, Conn., is completing plant at Natchez, Miss., for new branch works for automobile tire and tube manufacture, to develop minimum capacity of 2500 tires and tubes daily. Proposed to have plant ready for service in April. Cost about $1,000,000 with equipment. Output of mill will be taken by Sears, Roebuck & Co., Chicago, which is interested in project.

Board of Directors, State Industrial College, Frankfort, Ky., will take bids soon through Kentucky State Board of Education, Frankfort, for new power plant. Cost over $60,000 with equipment. Leo Oberwarth & Sons, West Second Street, Frankfort, are architects.

Board of City Commissioners, Memphis, Tenn., has approved new steel hangar with shop facilities for reconditioning and repairs at municipal airport. Cost about $58,000 with equipment. Financing has been arranged in part through Federal aid.

MIDDLE WEST

Joyce 7-Up, Inc., 12 Webster Street, Joliet, Ill., will ask bids soon on general contract for one and two-story mechanical-bottling and beverage plant near Joliet. Cost close to $250,000 with equipment; also for similar one and three-story branch bottling works at Thirty-first and Ashland Streets, Chicago. Cost about $200,000 with equipment. Graham, Anderson, Probst & White, 80 East Jackson Boulevard, Chicago, are architects for both structures.

Woodward Governor Co., Mill Street, Rockford, Ill., manufacturer of turbine and engine governors, and kindred power equipment, will take bids soon on general contract for one-story addition, 40 x 80 ft. A traveling crane will be installed. Cost over $40,000 with equipment. Willis W. Hubard, Gas & Electric Building, is architect.

Homestake Mining Co., Lead, S. D., has authorized expansion and improvements in milling division at local gold mill, in connection with opening of a new shaft. Cost over $1,500,000 with machinery.

Constructing Quartermaster, Denver, asks bids until Feb. 13 for armored metallic cable (Circular 6347-13).

Utah Radio Products Co., 820 North Orleans Street, Chicago, is concluding arrangements for purchase of former plant of Grigsby-Grunow Co., manufacturer of similar equipment, now defunct, for a consideration of $110,000. Structure will be improved with removal of present works to new location and facilities for increased production.

City Council, Muscatine, Iowa, asks bids until Feb. 17 for cooling tower intake and other work at municipal electric power plant, where expansion and improvements will be carried out. Complete project will cost about $480,000. Young & Stanley, Inc., Muscatine, is consulting engineer.

Chicago, Wilmington & Franklin Coal Co., 332 South Michigan Avenue, Chicago, plans new mechanical-washing plant for salvaging coal from refuse rock at mining properties at West Frankfort, Ill. Cost over $50,000 with machinery. Allen & Garcia, address noted, Chicago, are consulting engineers.

Tri-State Power Co-Operative, Boscobel, Wis., has chosen A. Y. Taylor, St. Louis, as consulting engineer on large rural power plant project under Wisconsin Development Authority, 524 Tenney Building, Madison, Wis. Work will begin about April 1.

City Council, Sheboygan, Wis., has commissioner Satre & Senescall, local architects, to design alterations and additions to factory building at Fifteenth and Illinois Streets for occupancy by Moe-Bridges Corp., Milwaukee, manufacturer of electric lighting fixtures, and affiliate, Sprayit Corp., Milwaukee, maker of paint and other spraying machines, for occupancy about May 1.

Board of Vocational Education, Green Bay, Wis., has low bid of $75,985 on general contract for addition to manual training and domestic science institute to cost about $145,000 complete. H. O. Eiken is director of school.

PACIFIC COAST

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Mar. 1 for motor-driven pumping machinery, piping and air-conditioning equipment for dry dock at Puget Sound Navy Yard (Specifications 8970).

Lockheed Aircraft Corp., Burbank, Cal., has let general contract to Myers Brothers Co., 3407 San Fernando Road, Los Angeles, for one-story addition, 50 x 220 ft., for expansion in press division. Cost close to $100,000 with equipment. John and Donald B. Parkinson, Title Insurance Building, Los Angeles, are architects.

United States Engineer Office, Seattle, asks bids until Feb. 16 for one locomotive-type boiler (Circular 139).

Public Utility District No. 1, Lewis County, Courthouse, Chehalis, Wash., G. A. Peters, secretary, asks bids until Feb. 20 for power plant equipment for power supply for rural electric system, including two diesel engine-generator units, each about 47-kva. capacity, fuel tank, switchboard and auxiliary equipment. Baar & Cunningham, Spalding Building, Portland, are consulting engineers.

Worley & Co., 260 North Furfee Avenue, Pico, Los Angeles, manufacturers of steel lockers, shelving and other sheet steel products, have awarded general contract to Myers Brothers Co., 3407 San Fernando Road, for one-story addition, 60 x 160 ft. Cost close to $50,000 with equipment. Gable & Wyant, 3723 Wilshire Boulevard, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 24 for 12 motor-driven centrifugal pumps, spare parts and tools (Schedule 5493), two water-tube boilers, with valves, fittings, soot blowers, fuel oil burners, casings, combustion control equipment and spare parts (Schedule 5501), three motor-driven centrifugal pumps, each with motor, controller and spare parts (Schedule 5503) for Mare Island Navy Yard.

California Ink Co., 1136 Maple Avenue, Los Angeles, printing inks, etc., has let general contract to Austin Co. of California, Inc., 777 East Washington Street, for one-story plant unit, 80 x 140 ft., at 2943 East Pico Boulevard, for storage and distribution. Cost about $50,000 with equipment. R. E. Ward, 777 East Washington Street, is engineer.

FOREIGN

Banloc Mfg. Co., Ltd., Baicoiu, near Bucharest, Rumania, recently organized to manufacture rubber products, has approved plans for new mill for production of automobile tires and tubes, to cost over $500,000 with machinery. Majority of equipment will be purchased in United States. B. F. Goodrich Co., Akron, Ohio, is furnishing technical assistance for new mill but, it is stated, will have no financial interest in project.

Tramway and Power House Department, Brisbane, Queensland, Australia, asks bids until March 24 for one 18,750-kw. steam turbo-alternator unit with accessories, including condensing plant, heaters, pumping machinery and auxiliary equipment.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

. . . Slight improvement seen in domestic ordering . . . Needs of aircraft engine builders furnishing backlog of market in the East.

Expanding Domestic Volume Coming from Wide Sources

CINCINNATI — Apparently consolidating gains made in recent weeks, the local machinery market remained relatively stationary during the past week. A slight fluctuation was noted in the relative proportion of domestic and foreign business, with the domestic showing a small, but encouraging gain. In fact, one manufacturer of small tools indicated that out of more than a dozen machines sold last week, only one was for export. Of course, Government orders continue to come in, but these are not in more than three-tool lots, while the bulk of other business is for single units. Foreign business still has a marked armament tinge, but domestic business is coming from widely scattered sources, with automobile makers, agricultural machinery makers, office equipment producers present as well as the Federal Government.

Plant operations are becoming more in line with bookings. Heretofore, several factories were operating on stock replenishing to keep forces intact against anticipated improvement. Market average of about 50 per cent operations is not more than 5 to 10 per cent above bookings.

Slight Improvement in Buying Noted in Chicago Area

CHICAGO—Slightly more activity both in machine and small tools has further improved sentiment in this district. The International Harvester program remains the sole list of importance, but a smattering of miscellaneous business is considered a helpful sign. Items on the Harvester list will be placed from time to time over a long period. No railroad buying of importance has been reported, but sellers believe replacement of antiquated equipment will be absolutely necessary if car building or large scale repairs are undertaken this year.

Heavy Janucry Billings Reflect Year-End Sales

CLEVELAND—Market activity in this district continues stabilized at the January level. Billings during the first month of the year were heavy, but included considerable business actually placed before the turn of the year.

Current inquiry includes equipment for a local body manufacturer, an electrical company and a down-state supplier of welding equipment. Most machine tool dealers continue to report difficulty in closing projected orders.

Aircraft Factories Chief Factor in Eastern Market

NEW YORK—Inquiry and buying on the part of aircraft engine and parts manufacturers are furnishing the chief support to the market in this area. There is every indication that the pace of expansion and re-equipping for cost reduction purposes is being accelerated over that of last year. Arsenal and Navy yard activity is also prominent in the Eastern picture. Except for this business, general buying is dull. The order level in January was equal on the average to that of December.

The Brown Hoist Corp., Bay City, Mich., was the low bidder for cranes required at the Charlestown, Mass., Navy yard. The company's bid was $122,000.

No Extensive Retooling Seen for 1940 Auto Models

DETROIT—Lack of general inquiries indicative of major mechanical changes for 1940 model automobiles forces the conclusion that large programs, requiring machine tools, will not be fostered by the industry this year. Tool and die shops engaged in automotive work have sold substantial quantities of time and some die programs have been placed, it is understood.

Pratt & Whitney Builds Engines For 100 French Planes

THE Pratt & Whitney Division, United Aircraft Corp., Hartford, Conn., is working on orders from the Curtiss-Wright Corp. for engine installations in 100 pursuit planes recently purchased by France. French representatives are at the Hartford plant for inspection and acceptance of the engines. The United Aircraft Corp. has no direct business from France.

Steel Ingot Rate in January 52.69%; Production Totaled 3,186,834 Tons

THE steel industry in January produced 3,186,834 gross tons of ingots and operated at an average rate of 52.69 per cent of capacity, according to the monthly calculations of the American Iron and Steel Institute. The percentage figure is based on the new capacity rating of 73,061,569 tons of ingots and castings (72,533,969 tons without castings) just announced by the institute and published in detail on another page of this issue.

The January rate compares with 53 per cent in December, indicating a slight falling off, but there would have been a moderate gain had the old capacity rating been used. The average rate in January, 1938, was 29.15 per cent.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Reported by Companies Which in 1936 Made 98.29 Per Cent of the Open-Hearth and 100 Per Cent of the Bessemer Ingot Production)

	Reported Production (Gross Tons)		Calculated Production All Companies		Number of Weeks	Per Cent of Capacity
	Open-Hearth	Bessemer	Monthly	Weekly		
1938						
January	1,604,363	99,991	1,732,764	391,143	4.43	29.15
February	1,550,772	125,493	1,703,726	425,932	4.00	31.74
March	1,822,398	157,737	2,012,406	454,268	4.43	33.85
1st Quarter	4,977,533	383,221	5,448,896	423,709	12.86	31.58
April	1,762,315	131,644	1,925,166	448,757	4.29	33.44
May	1,647,049	130,590	1,806,805	407,857	4.43	30.39
June	1,493,148	118,688	1,638,277	381,883	4.29	28.46
2d Quarter	4,902,512	380,922	5,370,248	412,778	13.01	30.76
1st 6 Months	9,880,045	764,143	10,819,144	418,212	25.87	31.17
July	1,821,815	127,982	1,982,058	448,429	4.42	33.42
August	2,309,306	196,789	2,546,988	574,941	4.43	42.85
September	2,407,233	207,887	2,657,748	620,969	4.28	46.28
3d Quarter	6,538,354	532,658	7,186,794	547,357	13.13	40.79
9 Months	16,418,399	1,296,801	18,005,938	461,691	39.00	34.41
October	2,844,358	223,208	3,117,934	703,823	4.43	52.45
November	3,312,319	201,246	3,572,220	832,685	4.29	62.05
December	2,932,279	158,965	3,143,169	711,124	4.42	53.00
4th Quarter	9,088,956	583,419	9,833,323	748,350	13.14	55.77
Total	25,507,355	1,880,220	27,839,261	533,933	52.14	39.79
1939						
January	2,986,455	147,494	3,186,834	719,376	4.43	52.69